SECTION A

PART A APPLICATION

SECTION A

PART A APPLICATION
[329 IAC 3.1-13-3, 40 CFR 270.11 (A) AND (D), 270.13]

This Permit Application is submitted for the Detrex Corporation facility (Facility) located at 2537 LeMoyne Avenue, Melrose Park, Illinois, 60160. Detrex Corporation is the legal name of the Owner/Operator, however, the facility generally operates under the name Detrex Corporation Solvents and Environmental Services Division. The information in this section is supplied in accordance with 40 CFR 270.10(d), 270.11(a) and (d), and 270.13 as adopted in 35 IAC Sections 702.123, 702.126(a) & (d), and 703.181.

LIST OF ATTACHMENTS

ATTACHMENT A-1	PART A APPLICATION
ATTACHMENT A-2	FACILITY PLAN
ATTACHMENT A-3	FACILITY PHOTOGRAPHS
ATTACHMENT A-4	TOPOGRAPHIC MAP

The following attachments provide the information required in the Part A Permit Application.

Attachment A-1 provides the completed Part A Application.

Attachment A-2 provides a scale drawing of the facility showing the location of all hazardous waste management unit. There are no additional historic hazardous waste operations that have been discontinued.

Attachment A-3 provides photographs of the facility.

Attachment A-4 provides a topographic map, which extends at least one mile beyond the property boundary. Additional topographic mapping requirements are addressed in Section B of this permit renewal application.

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Form Approved, OMB No. 2050-0034 Expires 10/31/02
GSA No. 0248-EPA-OT

For EPA Regional Use Only		
Date Received Month Day Year	EPA United States Environmental Protection Agency Washington, DC 20460 **Hazardous Waste Permit Application Part A** *(Read the Instructions before starting)*	

I. Facility's EPA ID Number *(Mark 'X' in the appropriate box)*

☐ A. First Part A Submission ☐ B. Revised Part A Submission (Amendment #_____)

C. Facility's EPA ID Number	D. Secondary ID Number *(If applicable)*
ILD074424938	

II. Name of Facility

DETREX CORPORATION

III. Facility Location *(Physical address not P.O. Box or Route Number)*

A. Street

2537 LEMOYNE AVE.

Street *(Continued)*

City or Town	State	Zip Code
MELROSE PARK	IL	60160 –

County Code *(If known)*	County Name

B. Land Type (Enter code)	C. Geographic Location LATITUDE (Degrees, minutes, & seconds)	LONGITUDE (Degrees, minutes, & seconds)	D. Facility Existence Date Month Day Year
P	41 54 01 0	087 52 00 1	09 27 1974

IV. Facility Mailing Address

Street or P.O. Box

SAME

City or Town	State	Zip Code
		–

V. Facility Contact *(Person to be contacted regarding waste activities at facility)*

Name *(Last)*	*(First)*
CRAIG	DAVID

Job Title	Phone Number *(Area Code and Number)*
MGR. ENVIRO & SAFE	248 – 358 – 5800

VI. Facility Contact Address *(See Instructions)*

A. Contact Address Location	Mailing	Other	B. Street or P.O. Box
		X	POBOX 5111

City or Town	State	Zip Code
SOUTHFIELD	MI	48086 – 5111

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EPA ID Number *(Enter from page 1)*: ILD074424938

Secondary ID Number *(Enter from page 1)*:

VII. Operator Information *(See instructions)*

A. Name of Operator: DETREX CORPORATION

Street or P.O. Box: POBOX 51111

City or Town: SOUTHFIELD

State: MI

ZIP Code: 48086-5111

Phone Number *(Area Code and Number)*: 248-358-5800

B. Operator Type: P

C. Change of Operator Indicator: Yes [ ] No [XX]

Date Changed Month Day Year:

VIII. Facility Owner *(See instructions)*

A. Name of Facility's Legal Owner: DETREX CORPORATION

Street or P.O. Box: POBOX 51111

City or Town: SOUTHFIELD

State: MI

ZIP Code: 48086-5111

Phone Number *(Area Code and Number)*: 248-358-5800

B. Owner Type: P

C. Change of Owner Indicator: Yes [ ] No [XX]

Date Changed Month Day Year:

IX. NAICS Codes *(in order of significance; start in left box)*

First	2869	**Third**	
(Description)		*(Description)*	
Second		**Fourth**	
(Description)		*(Description)*	

X. Other Environmental Permits *(See instructions)*

A. Permit Type *(Enter code)*	B. Permit Number	C. Description
1	N/A	

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I	L	D	0	7	4	4	2	4	9	3	8												

XI. Nature of Business *(Provide a brief description)*

FACILITY ACCEPTS CONTAINERIZED HAZARDOUS WASTES. HAZARDOUS WASTE IS MAINTAINED IN STORAGE AREA PENDING SHIPMENT TO ANOTHER PERMITTED FACILITY.

XII. Process Codes and Design Capacities

A. PROCESS CODE - *Enter the code from the list of process codes below that best describes each process to be used at the facility. Thirteen lines are provided for entering codes. If more lines are needed, attach a separate sheet of paper with the additional information. For "other" processes (i.e., D99, S99, T04 and X99), describe the process (including its design capacity) in the space provided in item XIII.*

B. PROCESS DESIGN CAPACITY - *For each code entered in column A, enter the capacity of the process.*

1. **AMOUNT** - *Enter the amount. In a case where design capacity is not applicable (such as in a closure/post-closure or enforcement action) enter the total amount of waste for that process.*
2. **UNIT OF MEASURE** - *For each amount entered in column B(1), enter the code from the list of unit measure codes below that describes the unit of measure used. Only the units of measure that are listed below should be used.*

C. PROCESS TOTAL NUMBER OF UNITS - *Enter the total number of units used with the corresponding process code.*

PROCESS CODE	PROCESS	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
	Disposal:	
D79	Underground Injection Well Disposal	Gallons; Liters; Gallons Per Day; or Liters Per Day
D80	Landfill	Acre-feet; Hectare-meter; Acres; Cubic Meters; Hectares; Cubic Yards
D81	Land Treatment	Acres or Hectares
D82	Ocean Disposal	Gallons Per Day or Liters Per Day
D83	Surface Impoundment Disposal	Gallons; Liters; Cubic Meters; or Cubic Yards
D99	Other Disposal	Any Unit of Measure Listed Below
	Storage:	
S01	Container	Gallons; Liters; Cubic Meters; or Cubic Yards
S02	Tank Storage	Gallons; Liters; Cubic Meters; or Cubic Yards
S03	Waste Pile	Cubic Yards or Cubic Meters
S04	Surface Impoundment Storage	Gallons; Liters; Cubic Meters; or Cubic Yards
S05	Drip Pad	Gallons; Liters; Acres; Cubic Meters; Hectares; or Cubic Yards
S06	Containment Building Storage	Cubic Yards or Cubic Meters
S99	Other Storage	Any Unit of Measure Listed Below
	Treatment:	
T01	Tank Treatment	Gallons Per Day; Liters Per Day; Short Tons Per Hour; Gallons Per Hour; Liters Per Hour; Pounds Per Hour; Short Tons Per Day; Kilograms Per Hour; Metric Tons Per Day; or Metric Tons Per Hour
T02	Surface Impoundment Treatment	Gallons Per Day; Liters Per Day; Short Tons Per Hour; Gallons Per Hour; Liters Per Hour; Pounds Per Hour; Short Tons Per Day; Kilograms Per Hour; Metric Tons Per Day; or Metric Tons Per Hour
T03	Incinerator	Short Tons Per Hour; Metric Tons Per Hour; Gallons Per Hour; Liters Per Hour; Btu Per Hour; Pounds Per Hour; Short Tons Per Day; Kilograms Per Hour; Gallons Per Day; Liters Per Day; Metric Tons Per Hour; or Million Btu Per Hour
T04	Other Treatment	Gallons Per Day; Liters Per Day; Pounds Per Hour; Short Tons Per Hour; Kilograms Per Hour; Metric Tons Per Day; Metric Tons Per Hour; Short Tons Per Day; Btu Per Hour; Gallons Per Day; Liters Per Hour; or Million Btu Per Hour
T80	Boiler	Gallons; Liters; Gallons Per Hour; Liters Per Hour; Btu Per Hour; or Million Btu Per Hour
T81	Cement Kiln	Gallons Per Day; Liters Per Day; Pounds Per Hour; Short Tons Per Hour; Kilograms Per Hour; Metric Tons Per Day; Metric Tons Per Hour; Short Tons Per Day; Btu Per Hour; Liters Per Hour; Kilograms Per Hour; or Million Btu Per Hour
T82	Lime Kiln	
T83	Aggregate Kiln	
T84	Phosphate Kiln	
T85	Coke Oven	
T86	Blast Furnace	
T87	Smelting, Melting, Or Refining Furnace	Gallons Per Day; Liters Per Day; Pounds Per Hour; Short Tons Per Hour; Kilograms Per Hour; Metric Tons Per Day; Metric Tons Per Hour; Short Tons Per Day; Btu Per Hour; Gallons Per Hour; Liters Per Hour; or Million Btu Per Hour
T88	Titanium Dioxide Chloride Oxidation Reactor	
T89	Methane Reforming Furnace	
T90	Pulping Liquor Recovery Furnace	
T91	Combustion Device Used In The Recovery Of Sulfur Values From Spent Sulfuric Acid	
T92	Halogen Acid Furnaces	
T93	Other Industrial Furnaces Listed in 40 CFR §260.10	
T94	Containment Building - Treatment	Cubic Yards; Cubic Meters; Short Tons Per Hour; Gallons Per Hour; Liters Per Hour; Btu Per Hour; Pounds Per Hour; Short Tons Per Day; Kilograms Per Hour; Metric Tons Per Day; Gallons Per Day; Liters Per Day; Metric Tons Per Hour; or Million Btu Per Hour
	Miscellaneous (Subpart X):	
X01	Open Burning/Open Detonation	Any Unit of Measure Listed Below
X02	Mechanical Processing	Short Tons Per Hour; Metric Tons Per Hour; Short Tons Per Day; Metric Tons Per Day; Pounds Per Hour; Kilograms Per Hour; Gallons Per Hour; Liters Per Hour; or Gallons Per Day
X03	Thermal Unit	Gallons Per Day; Liters Per Day; Pounds Per Hour; Short Tons Per Hour; Kilograms Per Hour; Metric Tons Per Day; Metric Tons Per Hour; Short Tons Per Day; Btu Per Hour; or Million Btu Per Hour
X04	Geologic Repository	Cubic Yards; Cubic Meters; Acre-feet; Hectare-meter; Gallons; or Liters
X99	Other Subpart X	Any Unit of Measure Listed Below

UNIT OF MEASURE	UNIT OF MEASURE CODE
Gallons	G
Gallons Per Hour	E
Gallons Per Day	U
Liters	L
Liters Per Hour	H
Liters Per Day	V
Short Tons Per Hour	D
Metric Tons Per Hour	W
Short Tons Per Day	N
Metric Tons Per Day	S
Pounds Per Hour	J
Kilograms Per Hour	R
Million Btu Per Hour	X
Cubic Yards	Y
Cubic Meters	C
Acres	B
Acre-feet	A
Hectares	Q
Hectare-meter	F
Btu Per Hour	I

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I	L	D	0	7	4	4	2	4	9	3	8												

XII. Process Codes and Design Capabilities *(Continued)*

EXAMPLE FOR COMPLETING ITEM XII (shown in line number X-1 below): A facility has a storage tank, which can hold 533.788 gallons.

Line Number		A. Process Code (From list above)			B. PROCESS DESIGN CAPACITY 1. Amount (Specify)	B. 2. Unit Of Measure (Enter code)	C. Process Total Number Of Units	For Official Use Only
X	1	S	0	2	5 3 3 . 7 8 8	G	0 0 1	
	1	S	0	1	13,200	G	001	
	2							
	3							
	4							
	5							
	6							
	7							
	8							
	9							
1	0							
1	1							
1	2							
1	3							

NOTE: If you need to list more than 13 process codes, attach an additional sheet(s) with the information in the same format as above. Number the lines sequentially, taking into account any lines that will be used for "other" processes (i.e., D99, S99, T04 and X99) in item XIII.

XIII. Other Processes *(Follow instructions from item XII for D99, S99, T04 and X99 process codes)*

Line Number (Enter #s in seq w/XII)		A. Process Code (From list above)			B. PROCESS DESIGN CAPACITY 1. Amount (Specify)	B. 2. Unit Of Measure (Enter code)	C. Process Total Number Of Units	D. Description Of Process
X	1	T	0	4				In-situ Vitrification
	1							
	2							
	3							
	4							

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EPA ID Number *(Enter from page 1)*												Secondary ID Number *(Enter from page 1)*											
I	L	D	0	7	4	4	2	4	9	3	8												

XIV. Description of Hazardous Wastes

A. EPA HAZARDOUS WASTE NUMBER - *Enter the four-digit number from 40 CFR, Part 261 Subpart D of each listed hazardous waste you will handle. For hazardous wastes which are not listed in 40 CFR, Part 261 Subpart D, enter the four-digit number(s) from 40 CFR, Part 261 Subpart C that describes the characteristics and/or the toxic contaminants of those hazardous wastes.*

B. ESTIMATED ANNUAL QUANTITY - *For each listed waste entered in column A estimate the quantity of that waste that will be handled on an annual basis. For each characteristic or toxic contaminant entered in column A estimate the total annual quantity of all the non-listed waste(s) that will be handled which possess that characteristic or contaminant.*

C. UNIT OF MEASURE - *For each quantity entered in column B enter the unit of measure code. Units of measure which must be used and the appropriate codes are:*

ENGLISH UNIT OF MEASURE	CODE	METRIC UNIT OF MEASURE	CODE
POUNDS	P	KILOGRAMS	K
TONS	T	METRIC TONS	M

If facility records use any other unit of measure for quantity, the units of measure must be converted into one of the required units of measure taking into account the appropriate density or specific gravity of the waste.

D. PROCESSES

1. PROCESS CODES:

For listed hazardous waste: For each listed hazardous waste entered in column A select the code(s) from the list of process codes contained in item XII A. on page 3 to indicate how the waste will be stored, treated, and/or disposed of at the facility.

For non-listed hazardous waste: For each characteristic or toxic contaminant entered in column A, select the code(s) from the list of process codes contained in item XII A. on page 3 to indicate all the processes that will be used to store, treat, and/ or dispose of all the non-listed hazardous wastes that possess that characteristic or toxic contaminant.

NOTE: THREE SPACES ARE PROVIDED FOR ENTERING PROCESS CODES. IF MORE ARE NEEDED:

1. *Enter the first two as described above.*
2. *Enter "000" in the extreme right box of item XIV-D(1).*
3. *Use additional sheet, enter line number from previous sheet, and enter additional code(s) in item XIV-E.*

2. PROCESS DESCRIPTION: *If a code is not listed for a process that will be used, describe the process in the space provided on the form (D.(2)).*

NOTE: HAZARDOUS WASTES DESCRIBED BY MORE THAN ONE EPA HAZARDOUS WASTE NUMBER - Hazardous wastes that can be described by more than one EPA Hazardous Waste Number shall be described on the form as follows:

1. *Select one of the EPA Hazardous Waste Numbers and enter it in column A. On the same line complete columns B, C and D by estimating the total annual quantity of the waste and describing all the processes to be used to treat, store, and/or dispose of the waste.*
2. *In column A of the next line enter the other EPA Hazardous Waste Number that can be used to describe the waste. In column D(2) on that line enter "included with above" and make no other entries on that line.*
3. *Repeat step 2 for each EPA Hazardous Waste Number that can be used to describe the hazardous waste.*

EXAMPLE FOR COMPLETING ITEM XIV (shown in line numbers X-1, X-2, X-3, and X-4 below) - A facility will treat and dispose of an estimated 900 pounds per year of chrome shavings from leather tanning and finishing operation. In addition, the facility will treat and dispose of three non-listed wastes. Two wastes are corrosive only and there will be an estimated 200 pounds per year of each waste. The other waste is corrosive and ignitable and there will be an estimated 100 pounds per year of that waste. Treatment will be in an incinerator and disposal will be in a landfill.

Line Number		A. EPA HAZARD WASTE NO. (Enter code)				B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (Enter code)	D. PROCESS (1) PROCESS CODES (Enter)								D. PROCESS (2) PROCESS DESCRIPTION (If a code is not entered in D(1))
X	1	K	0	5	4	900	P	T	0	3	D	8	0			
X	2	D	0	0	2	400	P	T	0	3	D	8	0			
X	3	D	0	0	1	100	P	T	0	3	D	8	0			
X	4	D	0	0	2											Included With Above

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EPA ID Number *(Enter from page 1)*: I L D 0 7 4 4 2 4 9 3 8

Secondary ID Number *(Enter from page 1)*:

XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number		A. EPA Hazardous Waste No. (Enter code)	B. Estimated Annual Quantity of Waste	C. Unit of Measure (Enter code)	D. PROCESSES (1) PROCESS CODES (Enter code)	D. PROCESSES (2) PROCESS DESCRIPTION (If a code is not entered in D(1))
	1	F001	4,000	T	S01	
	2	F002	2,000	T	S01	
	3	U210	1,000	T	S01	
	4	U228	1,000	T	S01	
	5	U226	1,000	T	S01	
	6	D039	1,000	T	S01	
	7	D038	1,000	T	S01	
	8					
	9	D006	1,000	T	S01	
1	0	D007	1,000	T	S01	
1	1	D008	1,000	T	S01	
1	2	D010	1,000	T	S01	
1	3	D018	1,000	T	S01	
1	4					
1	5					
1	6					
1	7					
1	8					
1	9					
2	0					
2	1					
2	2					
2	3					
2	4					
2	5					
2	6					
2	7					
2	8					
2	9					
3	0					
3	1					
3	2					
3	3					

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GSA No. 0248-EPA-OT

EPA ID Number *(Enter from page 1)*	Secondary ID Number *(Enter from page 1)*
I L D 0 7 4 4 2 4 9 3 8	

XV. Map

Attach to this application a topographic map, or other equivalent map, of the area extending to at least one mile beyond property boundaries. The map must show the outline of the facility, the location of each of its existing and proposed intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all springs, rivers and other surface water bodies in this map area. See instructions for precise requirements.

XVI. Facility Drawing

All existing facilities must include a scale drawing of the facility (See instructions for more detail).

XVII. Photographs

All existing facilities must include photographs (aerial or ground-level) that clearly delineate all existing structures; existing storage, treatment and disposal areas; and sites of future storage, treatment or disposal areas (see instructions for more detail).

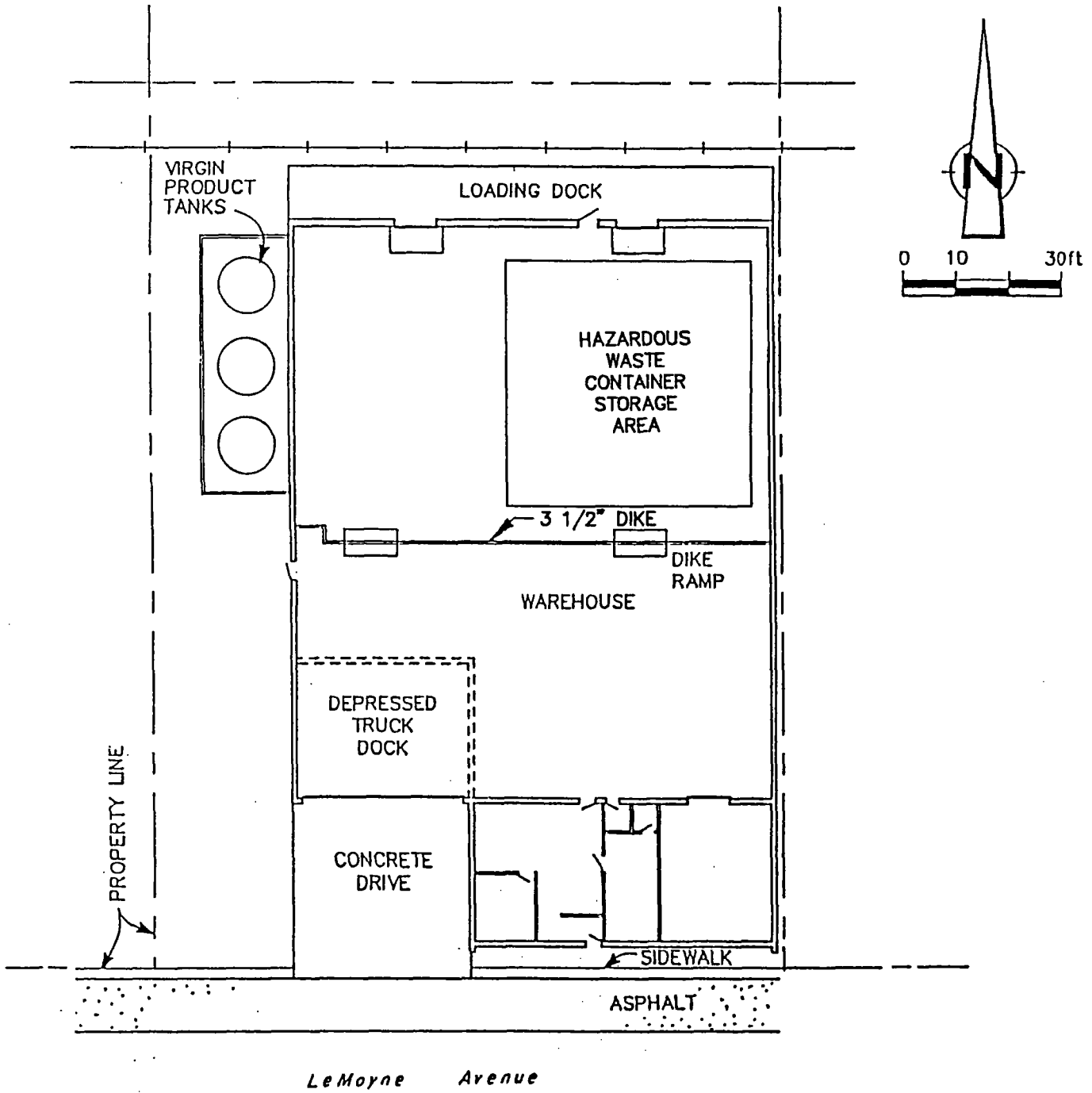
XVIII. Certification(s)

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Owner Signature: Robert M. Currie	Date Signed: 6-28-02
Name and Official Title (Type or print): ROBERT M. CURRIE, VICE PRESIDENT, GENERAL COUNSEL & SECRETARY	
Owner Signature	Date Signed
Name and Official Title (Type or print)	
Operator Signature: Robert M. Currie	Date Signed: 6-28-02
Name and Official Title (Type or print): ROBERT M. CURRIE, VICE PRESIDENT, GENERAL COUNSEL & SECRETARY	
Operator Signature	Date Signed
Name and Official Title (Type or print)	

XIX. Comments

Note: Mail completed form to the appropriate EPA Regional or State Office. (Refer to instructions for more information)



FACILITY PLAN
Detrex Corporation
Melrose Park, Illinois Facility

CRA

1. VIEW OF OUTSIDE OF FACILITY

2. VIEW OF COVERED AND RAMPED LOADING/UNLOADING AREA

3. VIEW OF HAZARDOUS WASTE CONTAINER STORAGE AREA AND SECONDARY CONTAINMENT DIKING WITH AN ACCESS RAMP

SOURCE: U.S.G.S. RIVER FOREST, ILL. QUADRANGLE MAP

SURROUNDING AREA TOPOGRAPHIC MAP

Detrex Corporation

Melrose Park, Illinois Facility

CRA

SECTION B

FACILITY DESCRIPTION

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SECTION B

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SECTION B

FACILITY DESCRIPTION

This section of the RCRA Part B Permit Application provides a general description of the Detrex Corporation facility in Melrose Park, Illinois, as required by Illinois Rule 35. The applicable sections of the Illinois Regulations are referenced where appropriate.

B-1 GENERAL DESCRIPTION
[35IAC 703.183(a)]

This Part B Permit Application is submitted by Detrex Corporation, for the facility located on LeMoyne Avenue in Melrose Park, Illinois. The facility is a treatment, storage, disposal (TSD) facility, by definition, for halogenated hydrocarbon waste solvents.

The Detrex facility is located in Cook County, Melrose Park, Illinois. The Street address is:

2537 LeMoyne Avenue
Melrose Park, Illinois, 60160

The principal contact person for this Application is:

Mr. David Craig
24901 Northwestern Highway
Southfield, Michigan 48075-2203

The facility specializes in the sale of halogenated solvents, cleaning equipment, and the collection of solvent wastes generated in degreasing and other cleaning operations. The facility operates under EPA Identification Number ILD 074424938. The Standard Industrial Classification Code (SIC Code) for the facility is 2869.

The hazardous waste operation at the facility in Melrose Park, Illinois consists of a container storage area used for the storage of drummed solvent wastes prior to the transfer of these wastes to an off-site Detrex solvent reclamation (recycling) facility, or to an off-site permitted treatment/disposal facility.

All wastes accepted at the facility are classified as F001 or F002 hazardous wastes under 35 IAC Part 721. The wastes are also dually classified as D-series wastes with respect to Toxicity Characteristic Leaching Procedure (TCLP) parameters.

B-2 TOPOGRAPHIC MAP

B-2a General Requirements [35 IAC 703.183(s)]

The topographic mapping and other location information requirements are summarized on Table B-1, which provides the location within this permit application where the appropriate map/information is located. Provided as Attachment B-1 is a figure that locates the facility within the City of Melrose Park.

1) Topographic Map

Attachment B-2 provides a facility map of the Detrex property and the immediate vicinity with topographic elevations at a scale of 1" = 20'. The topography of the surrounding area is illustrated on a portion of the United States Department of the Interior Geological Survey Quadrangle Map included as Attachment B-3.

2) Flood Control

As indicated in Section B-3b, the facility is not located in an area designated as a 100-year floodplain. As such, flood control structures/devices are not required. Attachment B-10 shows a portion of the Federal Insurance Administration (FIA) Flood Map for the Village of Melrose Park relative to the facility.

3) Runoff Control

The topographic maps presented in Attachments B-2 and B-3 indicates the surface water drainage pattern around the facility. Flow is promoted away from the building in all areas except for the concrete driveway.

Runoff in the area of the concrete driveway and the receiving area is controlled by a catchbasin that discharges to the 18-inch diameter combined sewer in front of the facility. The driveway is sloped down toward the facility while the truck dock is sloped down from north to south to prevent runoff water from entering the facility. A catchbasin located in the driveway provides drainage.

4) Zoning

Provided in Attachment B-4 is a color-coded zoning map for Melrose Park where the facility is located. The entire area within approximately 500 feet of the facility is zoned as industrial. In the area from 500 feet to 1,000 feet from the facility, in addition to industrially zoned land, there is some light manufacturing land on the east side of 25th Avenue east of the facility. There is also some flat residential land located east of the light manufacturing and southwest of the facility.

5) Wind Rose

A copy of a wind rose, provided by the National Climatic Data Center in Ashville, North Carolina, for Chicago's O'Hare Airport, is provided in Attachment B-5. The wind rose indicates that the prevailing wind in the vicinity of the facility is from between west and south.

6) Legal Boundaries

A copy of a plat survey indicating the property boundaries of the lands owned by Detrex Corporation is provided in Attachment B-6.

TABLE B-1

LOCATION OF REQUIRED TOPOGRAPHIC MAP INFORMATION

Items Required For Topographic Maps	*Location In Application (Attachment Nos.)*
1. Topograph map extending 1,000 feet beyond facility	B-2, B-3
2. Contour intervals	B-2, B-3
3. Map scale and date	B-2, B-3, B-4, B-6, B-10
4. 100-year floodplain area	B-10
5. Surface waters including intermittent streams	B-3
6. Surrounding land uses	B-4
7. Wind rose	B-5
8. Orientation of the map	B-1, B-2, B-3, B-4, B- 6, B-7, B-8, B-9, B-10
9. Legal boundaries of the facility	B-6
10. Access control and internal roads	B-7
11. Injection and withdrawal wells	N/A
12. Buildings	B-6, B-7, B-9,
13. Sewers	B-8
14. Loading and Unloading Areas	B-7
15. Fire Control Facilities	B-7
16. Barriers for drainage and flood control	N/A
17. Location of container storage area	B-9

7) Access Control

Attachment B-7 illustrates the access control devices at the facility. The hazardous waste management area is enclosed within a single building provided with security doors that are locked when the facility is unattended. Access is restricted to all but authorized persons.

8) Injection and Withdrawal Wells

As determined from the Melrose Park Engineering Department, there are no groundwater injection or withdrawal wells within the village of Melrose Park. This encompasses the area within a radius of 1,000 feet of the facility.

9) Sewers

Provided in Attachment B-8 is a figure locating the sewers near the facility. The only sewer present on LeMoyne Avenue in front of the facility is an 18-inch diameter combined sewer, which collects both sanitary and storm waters that flows to the east. The catchbasin in the concrete driveway is connected to this combined sewer. There are no process sewers utilized at this facility.

10) Loading and Unloading Areas

The loading and unloading area for the facility is shown on Attachment B-7. Trucks enter the facility via the concrete driveway from LeMoyne Street that provides direct access to the loading/unloading area in the south west corner of the facility.

11) Fire Control

Fire control is provided by fire extinguishers located within the facility and by the local fire department. There is a fire hydrant located directly in front of the facility (see Attachment B-7).

12) Hazardous Waste Container Storage Area

Provided in Attachment B-9 is a figure detailing the location of the hazardous waste container storage area within the building.

B-2b Additional Requirements for Land Disposal Facilities
[35 IAC 703.184.184, 703.185(c) and (d)]

Detrex Corporation does not and has never had a land disposal facility at the facility in Melrose Park, Illinois.

B-3 FACILITY LOCATION [320 IAC 4.1-34-5(b)(11)]

B-3a Seismic Standard [35 IAC 724.118]

The Detrex Corporation facility is located in Cook County, Melrose Park, Illinois.

There are no Illinois political jurisdictions designated as being located within a seismic area as identified under 40 CFR 264, Appendix VI (1985). As such, no information is required with regards to the seismic standard.

B-3b Floodplain Standard [35 IAC 703.184(c), 724.118(b)]

Attachment B-10 shows a portion of the Federal Insurance Administration (FIA) Flood Map for the Village of Melrose Park relative to the facility. The FIA Flood Map indicates the facility is not located within a 100-year floodplain (i.e. it is located within Zone C: areas of minimal flooding).

B-3b(1) Demonstration of Compliance [35 IAC 703.184(d), 724.118(b)]

As described in Section B-3b above, the facility is not located within a 100-year floodplain. Thus, the facility is in compliance with floodplain requirements.

B-3b(1)(a) Flood Proofing and Flood Protection Measures
[35 IAC 703.184(d)(1) and (d)(2)]

As described in Section B-3b above, the facility is not located within a 100-year floodplain. Thus, flood proofing and protection devices are not required.

B-3b(1)(b) Flood Plan [35 IAC 703.184(d)(3), 724.118(b)(1)(A)]

As described in Section B-3b above, the facility is not located within a 100-year floodplain. Thus, a flood plan is not required.

B-3b(2) Waiver for Land Storage and Disposal Facilities
[35 IAC 724.118(b)(1)(B)]

Detrex Corporation does not and has never operated a Land Storage and Disposal Facility at the facility in Melrose Park, Illinois.

B-3b(3) Plan for Future Compliance with Floodplain Standard
[35 IAC 703.184(e)]

As described in Section B-3b above, the facility is not located within a 100-year floodplain. Thus, a plan for future compliance is not required.

B-3c Other Location Requirements

Detrex Corporation does not and has never operated a land disposal facility of any type at the facility in Melrose Park, Illinois. Thus, there are no additional location requirements as per Section 21 of the Illinois Environmental Protection Act.

B-4 TRAFFIC INFORMATION [35 IAC 703.183(j)]

Attachment B-7 illustrates the traffic patterns at the facility. There is only one access point at the facility for vehicular traffic. Employees and visitors park off site.

All incoming and outgoing solvent wastes arrive and leave by truck. Typically, two trucks arrive per day transporting drummed hazardous wastes to the facility, and two or three trucks per month transport waste from the facility to an off-site Detrex reclamation (recycling) facility or to an off-site permitted treatment/disposal facility.

Design drawings of the facility dated January 27, 1956, indicate the concrete drive in the truck docking area is constructed of a 6-inch thick concrete pad provided with 6" x 6" No. 6 welded wire fabric placed on a compacted backfill (a copy of the design drawings is presented in Section D). Using conservative assumptions, the design load bearing capacity for the concrete drive is 15,000 pounds for a dual wheel load.

B-5 OPERATING RECORD [35 IAC 724.173]

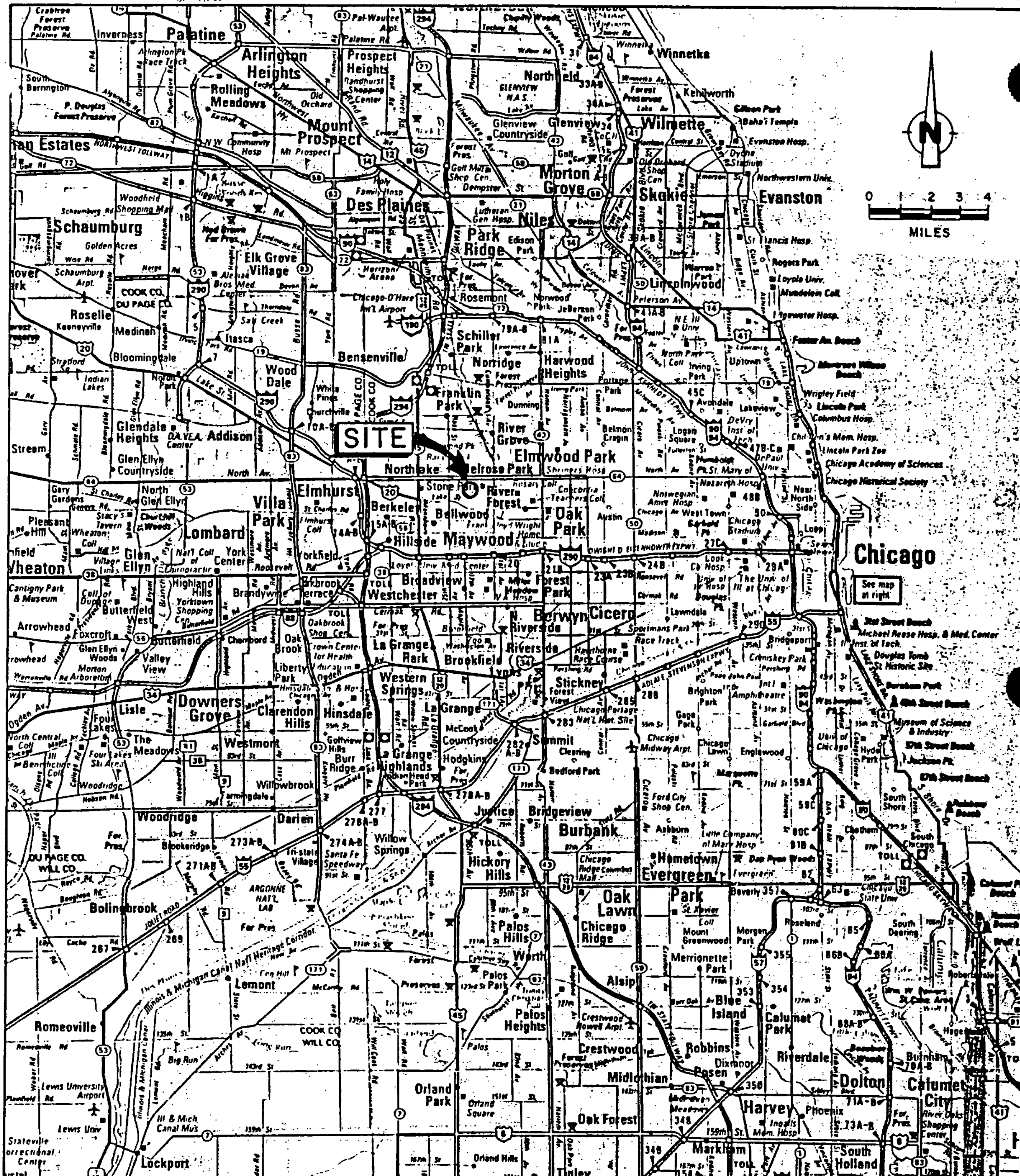
An operating record is maintained in a filing cabinet at the facility at all times. The filing is kept up-to-date to ensure safe and proper handling of all hazardous wastes.

The operating record consists of:

1) Copies of all waste analysis results;
2) Copies of all manifests and any required land ban forms for at least three years,
3) A log showing what manifested waste was received at the facility and the final disposition of each container of waste;
4) Copies of all regular inspection forms (for a minimum of three years);
   A copy of the facilities operating permit;
5) A copy of the most recent closure cost estimate;
6) A copy of any report required subsequent to implementation of the Contingency Plan;
7) A copy of all coordination agreements provided by appropriate emergency response agencies;
8) A copy of employee training acknowledgement forms; and
9) A copy of any correspondence/records from IEPA.

ATTACHMENT B-1

SITE LOCATION



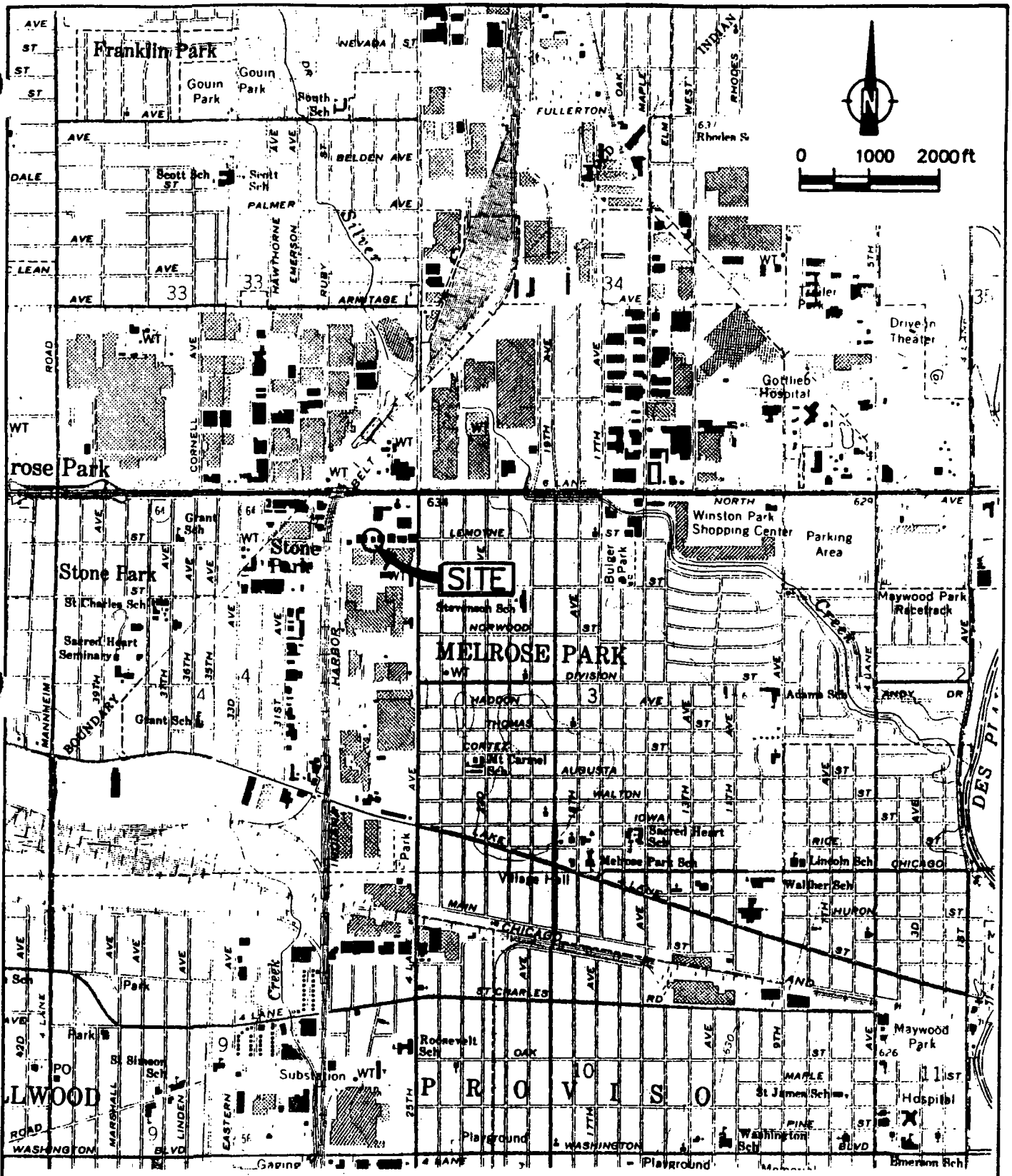
SOURCE: 1988 RAND McNALLY ROAD ATLAS

MELROSE PARK (CHICAGO)

SITE LOCATION
Detrex Corporation
Melrose Park, Illinois Facility

CRA

2471-19/10/88-3-F-0 REVISION 91-2 (07/19/91)



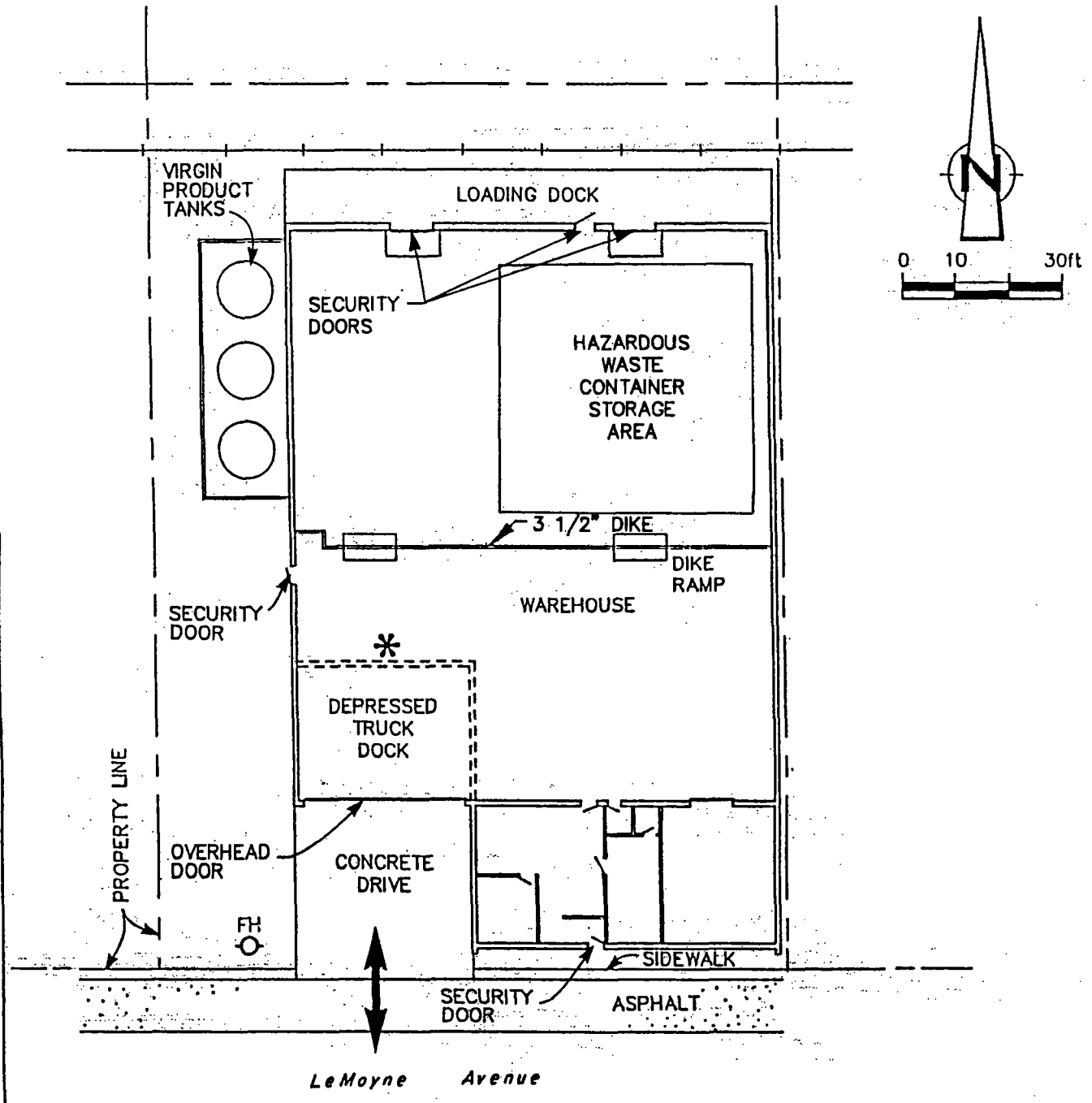
SOURCE: U.S.G.S. RIVER FOREST, ILL. QUADRANGLE MAP

CRA

SURROUNDING AREA TOPOGRAPHIC MAP

Detrex Corporation

Melrose Park, Illinois Facility



LEGEND

* CONTAINER LOADING/ UNLOADING AREA

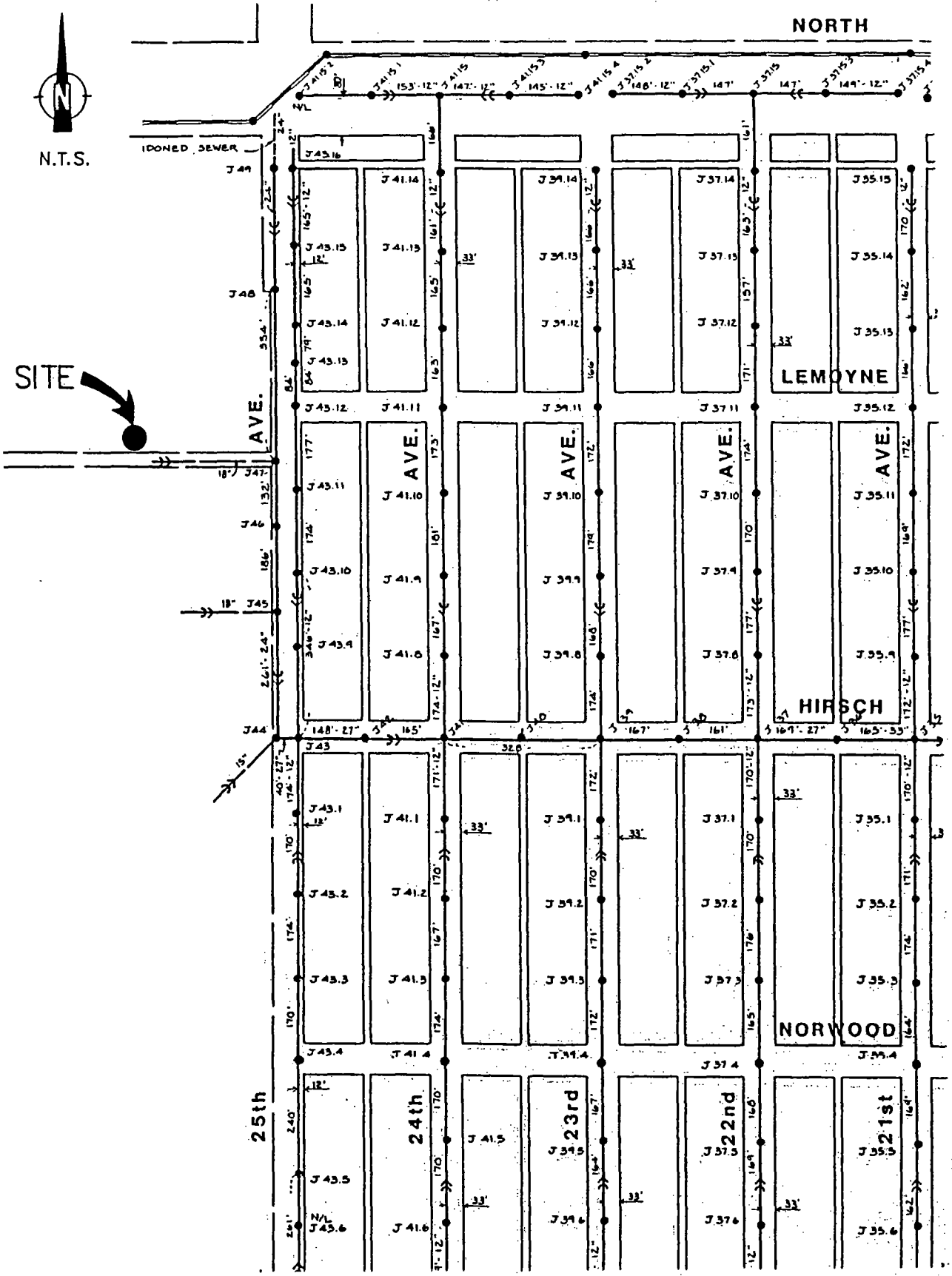
TRAFFIC PATTERN

FIRE HYDRANT

NOTE: ALL DOORS REMAIN LOCKED WHEN THE FACILITY IS UNATTENDED

ACCESS CONTROL
Detrex Corporation
Melrose Park, Illinois Facility

CRA



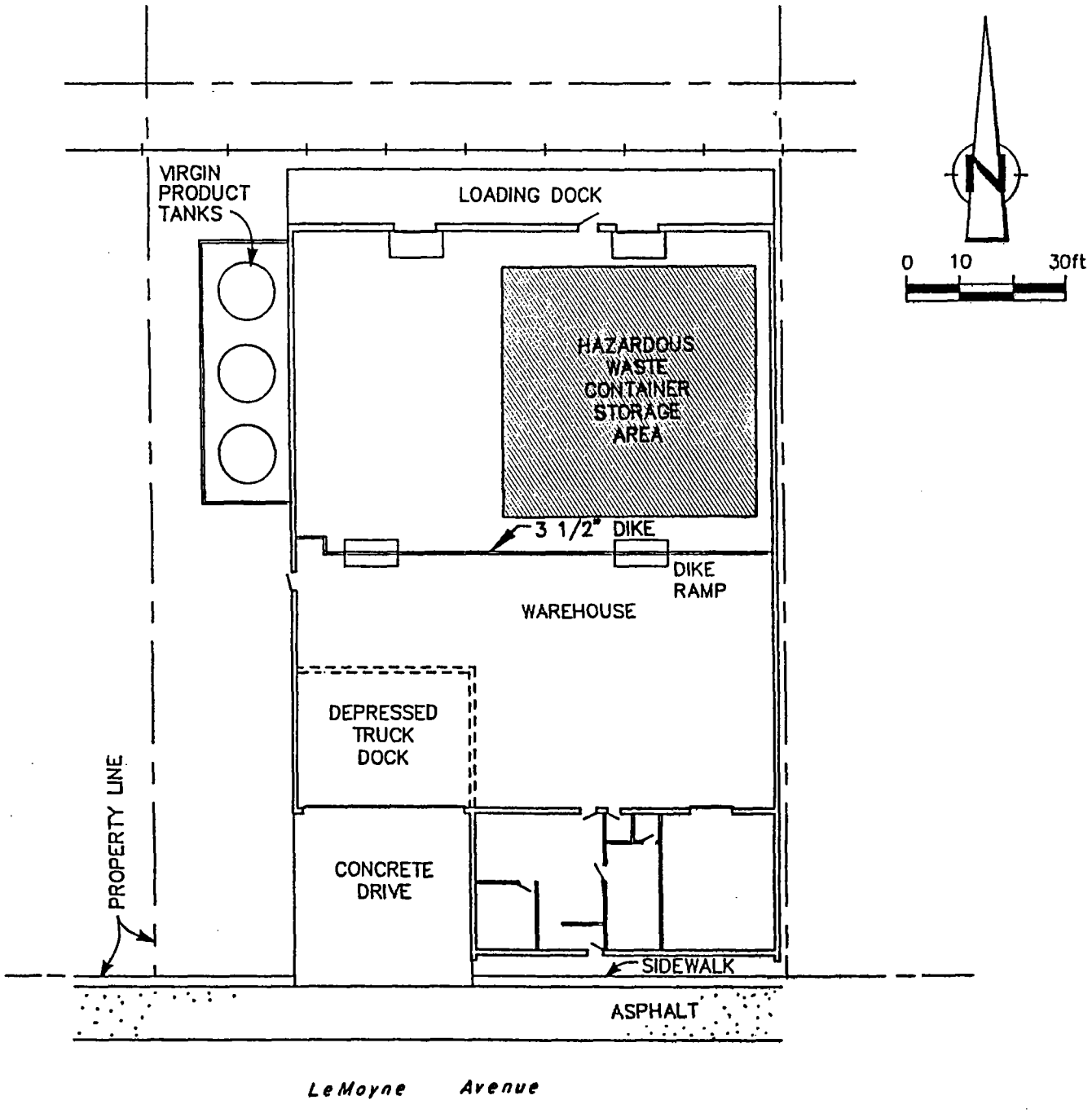
NOTE: SEWER IS STORM AND SANITARY COMBINED

CRA

SEWER LOCATIONS
Detrex Corporation
Melrose Park, Illinois Facility

ATTACHMENT B-9

HAZARDOUS WASTE CONTAINER STORAGE AREA



LEGEND

HAZARDOUS WASTE CONTAINER STORAGE AREA

HAZARDOUS WASTE CONTAINER STORAGE AREA

Detrex Corporation

Melrose Park, Illinois Facility

CRA

ATTACHMENT B-10

FLOOD HAZARD BOUNDARY MAP

TABLE OF CONTENTS

LIST OF ATTACHMENTS

SECTION C

WASTE CHARACTERISTICS

This section provides a description of the chemical and physical nature of the hazardous wastes managed in the container storage area at the Detrex Corporation facility (Facility) located in Melrose Park, Illinois.

The Facility in Melrose Park typically receives halogenated hydrocarbon solvent wastes in DOT Containers. Wastes are sent for reclamation (recycling) at an off-site Detrex reclamation (recycling) facility or to another TSDF for fuel blending. The Facility also sells virgin solvents, consequently, personnel are familiar with the wastes that are received at the Facility.

This waste characterization and analysis plan consists of an initial waste generation process review, waste characterization, and an ongoing waste screening analysis.

Based on the initial characterization, Detrex is able to determine the acceptability of the waste for the intended final destination (i.e. solvent recovery process), or shipment for treatment/disposal. Based on the screening analysis, Detrex is able to confirm the acceptability of the waste.

The system is designed to assure:

1. Only waste types/waste codes that are approved are accepted at the Facility.
2. Wastes that are potentially incompatible with each other are not combined.
3. Arriving waste shipments meet the description and characteristics as represented by the generator.

The information is provided pursuant to Illinois Rule 35 IAC, 40 CFR 270.14. The applicable sections of the Illinois Regulations as well as the applicable sections of the Federal Regulations are referenced as appropriate.

C-1 CHEMICAL AND PHYSICAL ANALYSIS

[35 IAC 703.183(b), 724.113(a), 40 CFR 270.14(b)(2), 264.13(a), 266.102(a)(2)(ii), 266.102(b)]

The wastes to be accepted for storage at the Facility may include solid, liquid and sludge material containing the constituents in Attachment C-1. Wastes accepted at the Facility may be combined/commingled in DOT approved containers to allow for ease of handling prior to being manifested to another Detrex Corporation facility for recovery via distillation, or transported off site to another permitted facility approved to handle the waste.

All DOT containerized hazardous wastes stored at the Facility are properly marked and labeled to identify the drums contents. This allows personnel to easily identify each drum and to handle it in the appropriate manner.

Non-hazardous (i.e., non-RCRA) wastes at the Facility may be stored in DOT-approved containers within the hazardous waste storage area, or elsewhere within the container storage area. Non-hazardous waste may be combined/commingled to allow for ease of handling.

Provided as Attachment C-2 are representative Material Safety Data Sheets for the primary hazardous wastes constituents listed in Attachment C-1. These MSDSs describe in detail the chemical and physical properties of each waste managed at the Facility to allow for their safe handling in accordance with Illinois Rule 35. The chemistry reference texts listed below may also be on file at the Facility, or at the Corporate Office, to provide additional information.

1) *Handbook of Chemistry*, 9th Edition, N.A. Lange, 1956;
2) *Concise Chemical and Technical Dictionary*, 2nd Edition, H. Bennett, 1962;
3) *A Method for Determining the Compatibility of Hazardous Waste*, EPA-600/2-80-076, 1980;
4) *Merck Index*, 10th Edition, 1985;
5) *Handbook of Chemistry and Physics* (CRC), 73rd Edition, D.R. Lide, 1992-1993;
6) *Lange's Handbook of Chemistry*, 13th Edition, J.A. Dean, 1985; and
7) *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, EPA SW-846, 3rd Edition, 1986 with updates.

Detrex Corporation requires generators who want to ship waste to the Facility to complete a Waste Characterization process which includes the completion of a "Generator's Waste Material Profile Sheet". This procedure is designed to ensure that all wastes received by the Facility are acceptable within the scope of the Part B Permit, and the hazardous waste storage capabilities of the Facility. The Waste Material Profile Sheet forms the basis of information, which is used in determining if the waste can be accepted at the Facility. The process description (i.e., generator knowledge), physical characteristics, and a representative sample of the waste provide facility personnel with adequate information to determine if the waste can be accepted, or if additional data is required before a decision can be reached.

The Facility requires as part of their acceptance program that the generator complete a new profile sheet or a recertification sheet, on an annual basis. If at any time, the Facility is informed, or has reason to believe, that a waste stream has been altered, the generator is requested to complete a new profile sheet reflecting these changes. Each new profile sheet is reviewed as described previously. If Detrex believes, based upon process knowledge or familiarity with similar wastes, that a waste may need additional codes as toxic waste, but the generator does not acknowledge this, a Toxicity Characteristic Leaching Procedure (TCLP) test or a constituents metals test may be conducted by a certified laboratory in accordance with SW-846 procedures, or the generator may be asked to provide metals test results.

Typically, the Facility deals with hazardous wastes that contain greater than 500 parts per million by weight (ppmbw) Volatile Organic Concentration (VOC), which is documented in the Profile Sheet completed by the generator. In the event that the generator denotes that a hazardous waste contains less than 500 ppm VOC (at the point of origin), or the generator states that they have treated the waste to below the 500 ppmbw level, Detrex will request the generator to provide information that they have properly treated the waste as required under 40 CFR 264.1083(b) Waste Determination Procedures For Treated Hazardous Waste.

As described in Section C-2, Detrex personnel normally obtain the sample of the waste stream; however, this does not exclude the possibility of the generator providing their own sample or analysis. If the generator does not provide sufficient information, the generator is contacted and requested to provide additional written information and possibly supporting laboratory analyses as necessary to determine the acceptability of the waste.

To ensure that wastes received meet the waste profile provided by the generator, all wastes are screened (fingerprinted). The screening requirements for each type of waste are described in Section C-2. Tests performed may include: specific gravity, flammability, pH, free liquids, and compatibility. The waste is then reviewed for potential incompatibilities by determining its appropriate waste group and reactivity number in accordance with Section C-2b(5).

If analytical results reveal that a customer has shipped an unauthorized waste stream to the Facility, the customer will be notified immediately and appropriate arrangements made to return the container or transport it to an authorized treatment or disposal facility. Unauthorized waste streams will not be accepted by the Facility.

Containers are stored in the container storage area located within the Facility before being transported off-site. The hazardous waste container storage area is described in detail in Section D of this permit application.

C-1a Containerized Waste
[35 IAC 703.201(b)(1), 40 CFR 264.172, 270.15(b)(1)]

When Detrex has given notification that "the waste stream has been approved and Detrex has a permit to handle the waste stream," wastes may be shipped to the Facility in DOT-approved containers which meet with the standards outlined in 49 CFR Parts 173 and 178, and all applicable regulations. A copy of 49 CFR Parts 170 through 178 is either maintained at the office of the Facility or at Detrex Corporate Offices in the Risk Management Department.

Although it is the responsibility of the Generator to ensure that a DOT-approved container is compatible with the hazardous waste contents, Detrex will, when conditions warrant, verify that the container is compatible with the contents by utilizing DOT regulations as set forth in 49 CFR Parts 172, 173 and 178.

If it is determined that the waste and container are incompatible, then the material will either be repackaged in a DOT-approved container that is compatible, or over packed, if the waste is being accepted at the Facility. If the material cannot be received at the Facility, arrangements will be made with the generator to either return the waste to them or to transport it to another permitted TSDF. If waste can be accepted, then normal screening procedures will be followed.

Both liquid and solid hazardous wastes are stored within the container storage area located within a totally enclosed building. Adequate secondary containment is provided by the building walls, internal diking, and diked doorways for the containerized wastes. Details of the containers and the container storage area are provided in Section D of this permit application.

C-1b Waste in Tank Systems
[35 IAC 724.291(b)(2), 724.292(a)(2),40 CFR 264.190(a), 264.191(b)(2), 264.192(a)(2)]

Not applicable for this Facility. Hazardous wastes are not and never have been stored in tanks at the Detrex facility in Melrose Park, Illinois, hence a permit for a storage tank is not requested.

C-1c Waste in Piles [35 IAC 724.350(c)(1) and (4)]
[40 CFR 264.250(c)(1) and (4)]

Not applicable for this Facility. Hazardous wastes are not and never have been stored in waste piles at the Detrex facility in Melrose Park, Illinois; hence, a permit for a waste pile is not requested.

C-1d Landfilled Wastes [35 IAC 724.414(c)]
[40 CFR 264.13(c)(3), 264.314]

Not applicable for this Facility. Hazardous wastes are not and never have been landfilled at the Detrex facility in Melrose Park, Illinois; hence, a permit for a landfill is not requested.

C-1e Wastes Incinerated and Wastes Used in Performance Tests
[35 IAC 703.223(b)(1), 40 CFR 264.13(c)(3), 264.314]

Not applicable for this Facility. Hazardous wastes are not and never have been burned during operations at the Detrex facility in Melrose Park, Illinois; hence, a permit for an incinerator is not requested.

C-1f Wastes to be Land Treated
[35 IAC 703.206(B)(4), 724.371(A)(1) AND (2), 724.376, PART 721 APPENDIX H][40 CFR 270.20(b)(4), 264.271(a)(1) and (2), 264.272, 264.276, Part 261 Appendix VIII]

Not applicable for this Facility. Hazardous wastes are not and never have been land treated at the Detrex facility in Melrose Park, Illinois; hence, a permit for a land treatment system is not requested.

C-1g Waste In Miscellaneous Treatment Units
[40 CFR 270.23(d)]

Not applicable for this Facility.

C-1h Waste In Boilers And Industrial Furnaces
[40 CFR 266.102(b), 270.66(c)]

Not applicable for this Facility.

C-2 WASTE ANALYSIS PLAN
[35 IAC 703.183(c), 724.113(b) and (c)]

The Waste Analysis Plan for this Facility is generally comprised of two components. The first component is waste characterization/profiling to evaluate if a waste is permitted to be managed at the Facility. This segment is discussed in greater detail in section C-2d. The second component is waste screening/fingerprinting, which is conducted on every shipment of

waste received to ensure it meets the waste profile for the generator and to ensure it is properly managed within the Facility (i.e., compatibility with wastes already stored).

C-2a Parameters and Rationale

[35 IAC 724.113(B)(1), 40 CFR 264.13(b)(1), 40 CFR 270.14(b)(3), 264.13(b) and (c), 266.102(a)(2)(ii), 266.104(a)(2), 268.7]

The waste screening (i.e., fingerprinting) parameters for each waste type is presented in Attachment C-3. The parameters have been selected to fulfill the requirements of 40 CFR Part 261 with respect to the storage of the waste. In general wastes are inspected for characteristics such as color, consistency, odor, and physical state. Figure C-1, in Attachment C-3, provides a flow chart of the waste screening decision-making process. The rationale for each test is described in the following:

1) Specific Gravity - provides indication of potential recovery of product from distillation (recovery) system; and may be performed for internal purposes.
2) Flammability - provides verification that wastes which are not anticipated to be flammable, based on manifest information, are in fact non-flammable;
3) pH Testing - provides verification of corrosivity of wastes for storage purposes;

All hazardous wastes accepted at the Facility are classified as F001 or F002 hazardous waste, or the corresponding 'U' codes for these halogenated solvents, under Illinois Rule 35 IAC Part 721 Subpart D. As such, all wastes accepted at the Facility are restricted wastes pursuant to Rule 35 IAC Part 728. The wastes do not meet the applicable treatment standards set forth in Rule 35 IAC Part 728 Subpart D. Detrex Corporation utilizes knowledge of the waste to determine if such wastes exceed applicable treatment standards. These wastes are also recognized as D-series compounds based on Toxicity Characteristic Leaching Procedure (TCLP) or total metals test for liquids, as presented in Attachment 1.

C-2b Test Methods

[35 IAC 724.113(b)(2), 40 CFR 264.13(b)(2), 264.13(c)(1)]

Testing will be performed as detailed in the Quality Assurance Project Plan (QAPP) provided in Attachment C-4 as briefly described in the subsections below. The QAPP provides the policies, objectives, specific quality assurance (QA) and quality control (QC) procedures to achieve the data quality objectives of the testing. The results of these tests are recorded and evaluated with respect to the pre-approved information.

Sampling and analysis are completed as soon as possible after receipt of a waste shipment to allow for transfer of the waste to the container storage area.

C-2b(1) Specific Gravity

Samples for performing specific gravity analysis may be either performed on a composite or on a discrete sample. The specific gravity may be obtained to determine the approximately recoverable solvent in the product returned for reclamation. Specific gravity data will not be used to reject material transported to the Facility for reclamation.

C-2b(2) Flammability

A flammability potential screening analysis will be performed, on a discrete sample. At least 10% of the each hazardous waste stream received from each generator will be tested in accordance with the requirements of ASTM method D4982-89 as described in the QAPP and listed in Attachment C-4. If the test concludes the sample is non-flammable, then the waste stream will have passed the flammability criteria. If the test concludes that the sample is flammable, then the entire number of containers will be rejected, or a representative sample will be taken from each container. The samples from each container will then be tested for ignitability to determine what container, or containers, fails the flammability test. The individual containers failing the flammability test will be rejected or the sample(s) will be tested for ignitability using ASTM Method D3278-89 as described in the QAPP and listed in Attachment C-4 to determine their flash point. If the material fails the ignitability test, the material will be rejected. Waste rejection procedures are described in Section C-2b (4).

C-2b(3) pH Testing

To determine if a waste exhibits an unexpected pH, Detrex may at its discretion, measure and record the pH on a sample using the method described in the QAPP. The pH of the resultant mixture and observations on the formation of gases, vapors, or fumes are recorded. Any container that exhibits a pH $\geq$ 12.5 or $\leq$2.0 will be rejected. Waste rejection procedures are described in Section C-2b (4).

C-2b(3) Compatibility Procedure

Waste compatibility is an important aspect of the Facility's waste management operation. Further details are presented in Section F-5, however a general discussion follows.

The initial step in evaluating waste compatibility is to determine the appropriate hazardous waste group (i.e. reactivity group number) for each waste stream in accordance with the USEPA guidance document *A Method for Determining the Compatibility of Hazardous Waste*, EPA-600/2-80-076, April 1980. Based on this review for the waste streams applied for under this permit, the reactivity code for all chlorinated solvents is number 17 and therefore will not present any issue of incompatibility. In addition,

Detrex conducts a visual inspection of the hazardous waste during screening of the waste. Observations are made during sampling pertaining to abnormal solid content, color, or if it is an aqueous solution rather than an oil/solvent mixture.

It should also be noted that all transportation of hazardous wastes to the Facility is conducted in accordance with all appropriate DOT requirements, including 49 CFR §177.848, which applies to segregation of hazardous materials during shipping

C-2b(4) Waste Rejection Procedure

In the event the screening/fingerprinting indicates that the waste does not match the profile/characterization, the following waste rejection procedure must be followed:

1) The generator/broker is contacted to discuss the discrepancies identified during the testing process.
2) If it is determined that the discrepancies can be resolved, they are noted on the manifest. If the waste is acceptible under the permit, it is transferred to the storage area.
3) If it is determined that the discrepancies cannot be resolved, and that the waste stream differs from the pre-approved waste, but is acceptable under the Facility's permit, the generator may be required to re-manifest the waste, or a discrepancy will be noted in the discrepancy box of the manifest. To expedite the process, the generator may be required to submit a new manifest via overnight delivery. The corrected manifest is then signed by the transporter and the Facility, and the wastes are transferred to the storage area.
4) In the event the screening process determines a waste material is not acceptable, the generator will be contacted. The Facility may either ship the waste back to the generator, or ship the waste material to the another facility, if the generator provides Detrex with an alternate disposal site. In any case, shipment of the returned material will be handled in accordance with manifesting requirements as defined by 49 CFR §172.205. A discrepancy will be noted in the discrepancy section of the manifest, noting the reason for rejection.

C-2c Sampling Methods

[35 IAC 724.113(b)(3), 40 CFR 264.13(b)(3), Part 261 Appendix I, Part 266 Appendix IX]

The collection of representative waste samples for screening (i.e., fingerprinting) is conducted by facility personnel according to the sample collection procedures described in the QAPP. The sampling procedures are provided for both liquid and solid samples.

The screening process for wastes consists of sampling, visual observation of the waste, and testing of the waste. Specifically, every container of waste received at the Facility is sampled. Containers are unloaded into the staging area (see Section D-1c) and

sampled. Any unusual visual observations of unexpected sample characteristics such as color, consistency, odor, and physical state are recorded.

Several problems can occur during container sampling that may compromise the integrity of the sample collected. Among these are: obstructions in the containers that inhibit the full depth of the container from being sampled; layering of liquids with different viscosities which makes sampling difficult (more viscous liquids will tend to adhere to the outside of the sampling device); and extremely hard solids that are difficult to sample. Possible solutions to these problems include: angling the sampling device to avoid the obstruction; allowing the viscous liquid to drip off the sampling device back into the container prior to transferring the sample from the container; and using alternate sampling equipment such as a non-sparking chisel and mallet.

To minimize drippage during sampling of liquids, a funnel system or absorbent pad may be placed on the container or tanker prior to sampling and the exterior of the sampling device will be allowed to thoroughly drain back into the container prior to transferring the sample into the sample container. Absorbent pads will be managed in the same manner as the waste, should the waste drip on the pad.

C-2d Frequency of Analyses [35 IAC 724.113(b)(4)]
[40 CFR 264.13 (A)(3), 264.13(B)(4)]

C-2d(1) Waste Characterization

Detrex Corporation requires generators who want to ship waste to the Facility to complete a Waste Characterization process which includes the completion of a "Generator's Waste Material Profile Sheet". This procedure is designed to ensure that all wastes received by the Facility are acceptable within the scope of the Part B Permit, and the hazardous waste storage capabilities of the Facility. The Waste Material Profile Sheet forms the basis of information, which the Facility uses in determining if the waste can be accepted at the Facility. The process description (i.e., generator knowledge), physical characteristics, and a representative sample of the waste provide Facility personnel with adequate information to determine if the waste can be accepted, or if additional data is required before a decision can be reached.

The Facility requires as part of their acceptance program that the generator complete a new profile sheet or a recertification sheet, on an annual basis. If at any time, the Facility is informed, or has reason to believe, that a waste stream has been altered, the generator is requested to complete a new profile sheet reflecting these changes. Each new profile sheet is reviewed as described previously. If Detrex believes, based upon process knowledge or familiarity with similar wastes, that a waste may need additional codes as toxic waste, but the generator does not acknowledge this, a Toxicity Characteristic Leaching Procedure (TCLP) test or a constituents metals test may be conducted by a certified laboratory in accordance with SW-846 procedures, or the

generator may be asked to provide metals test results. A copy of a typical profile sheet is found in Attachment C-5.

C-2d(2) Waste Screening/Fingerprinting

Screening/Fingerprinting, as described Section C-2a, is conducted on each shipment of waste received at the Facility. The sampling is completed as rapidly as possible after receipt of the waste in order that it may be transferred to the container storage area.

It should be noted that this Facility may accept wastes from other Detrex facilities. The other Detrex facilities are required to profile and test the materials prior to acceptance in accordance with their specific waste analysis plan. Consequently, when this Facility accepts wastes manifested from other Detrex facilities, the wastes have already been profiled and tested in accordance with a waste analysis plan. Performing a second screening at this point will not provide any additional information. In such an event, Detrex may at its option obtain copies of the test results from the other Detrex facility in lieu of retesting the material. These results will be filed at this Facility and cross-referenced back to the other Detrex facility that shipped the material. The results will become part of the operating record.

In the event that the results of analysis performed on a composite sample indicates that the waste stream is potentially unacceptable at the Facility, representative samples from each container used in making the composite may be collected and tested to determine which container(s) contributed to the potentially unacceptable results. As discussed in Section C-2a(1) and D-1a(2), containers, which are unacceptable, will be:

i) rejected and returned to the generator; or
ii) re-manifested to another permitted facility pursuant to the generator's request, with a note in the discrepancy section of the manifest.

C-2d(3) Annual Waste Review

Each waste stream will be re-characterized annually, at a minimum, or when Detrex is notified or has reason to believe that the process or operation generating the hazardous waste has changed; or when the results of waste shipment inspections indicate that the hazardous waste received at the Facility does not match the waste designated on the accompanying manifest. Detrex has implemented procedures requiring generators to notify Detrex when operation procedures change.

C-2e ADDITIONAL REQUIREMENTS FOR WASTES GENERATED OFF-SITE

[40 CFR 264.13(b)(5) and (c), 264.73(b)]

As noted in Section C-1, the following requirements are in place for off-site waste generators.

Prior to any hazardous waste material being accepted for storage at the Melrose Park facility from a new customer, an initial waste characterization assessment is conducted and the generator completes a Generator's Waste Materials Profile Report. If the Facility is informed, or has reason to believe that a waste stream has been altered, the generator is requested to complete a new profile record reflecting these changes. Each new profile record is reviewed to characterize the waste steam and to determine if the waste stream can be accepted.

C-2f Additional Requirements for Ignitable, Reactive or Incompatible Wastes
[35 IAC 724.113(b)(6),724.117]

The Facility does not accept ignitable, reactive or incompatible waste at the hazardous waste container storage area; hence, the additional waste analysis requirements are not applicable.

C-2g ADDITIONAL REQUIREMENTS PERTAINING TO BOILER AND INDUSTRIAL FURNACES
[40 CFR 266.102(e)(6)(ii)(C), 266.102(e)(6)(iii)]

Not applicable to this Facility.

C-2h ADDITIONAL REQUIREMENTS PERTAINING TO CONTAINMENT BUILDING
[40 CFR 264.1100]

Not applicable to this Facility.

C-3 WASTE ANALYSIS REQUIREMENTS PERTAINING TO LAND DISPOSAL RESTRICTIONS
[40 CFR 262.10, 262.11, 264.13, 264.73, 266.102(a)(2)(ii), Part 268, 270.14(b)(3)]

C-3a WASTE ANALYSIS
[40 CFR 261.21 through 261.24, 264.13(a)(1), 268.1, 268.7, 268.9, 268.32 through 268.37, 268.41 through 268.43]

Facility personnel are familiar with the Land Disposal Restrictions (LDRs) requirements. Hazardous waste streams managed at the Facility are prohibited from land disposal. This is known from the waste profile report, generator knowledge, or from

analytical testing. A copy of each LDRF is retained at the Facility for the retention period required under 40 CFR 268.

The Facility requires generators to either have a Land Disposal Restriction Form (LDRF) on file, or to provide a LDRF with the manifest at the time of shipment. The Facility will consider the LDRF current if the generator signed it, or has provided notification that information on the land ban form is current, within the past 365 days. This will typically be done at the same time that the profile renewal occurs to allow facility personnel the ability to verify consistency between the two documents.

In the event the generator supplies LDRFs with every shipment, if required under other state laws or for other TSDFs, Facility personnel will review LDRF prior to acceptance to ensure accuracy.

In the event that the Facility receives a load of waste without a LDRF (either on file or with the shipment), or with obvious incorrect/incomplete information, the following actions will be taken:

1. Contact the generator to discuss the discrepancies or errors found on the LDRF. Obtain the generators approval to physically alter the LDRF to correct the discrepancies or errors found. Facility personnel will denote the individual providing permission to change the LDRF. A copy will be sent to the generator;
2. Correct the LDRF with the generators consent, for example by adding waste streams to the LDRF based on information listed in the profile sheet; or
3. Have the generator send a copy of the LDRF via facsimile to the Facility with the complete and correct information on the form. The facsimile copy will be held as would an original in the files.

When the Facility ship LDR wastes, following storage or combining/commingling, the Facility will complete the LDRF. In many cases, these LDRFs will be generated based on the original generator's knowledge of the waste, testing, and profiling since these had been conducted prior to acceptance. In the cases where there may be a question regarding the level of a constituent, or if one is present, analytical testing may be conducted.

C-3a(1) Spent Solvent And Dioxin Wastes

[40 CFR 264.13(a)(1), 268.2(f)(1), 268.7, 268.30, 268.31]

Generator knowledge will be used to determine the presence of spent solvent wastes. Generator knowledge will be documented on the Waste Material Profile Report and LDRF. The LDRF will provide additional information regarding the appropriate treatment standards for the waste and whether it has already been treated to the appropriate standards or not.

Dioxin wastes (F020-F023; F026-F028) are not accepted at the Facility.

C-3a(2) Listed Wastes

[40 CFR 264.13(a)(1), 268.7, 268.33, 268.34, 268.35, 268.36, 268.41, 268.42, 268.43]

Generator knowledge will be used to determine whether listed wastes meet the applicable treatment standards or to demonstrate that the waste has been treated by the appropriate specified treatment technology. Process knowledge will be documented on the Waste Material Profile Report and LDRF.

C-3a(3) Characteristic Wastes

[40 CFR 261.3(d)(1), 264.13(a)(1), 268.7, 268.9, 268.37, Part 268 Appendix I, Part 268 Appendix IX]

Generator knowledge will be used to determine whether a characteristic waste meets the applicable treatment standards or to demonstrate that the waste has been treated by the appropriate specified treatment technology. In addition, analytical data may be used to identify underlying hazardous constituents that are expected to be present. The generator knowledge and analytical data will be documented on the Waste Material Profile Report and LDRF.

C-3a(4) Radioactive Mixed Waste

[40 CFR 268.7, 268.35(c), 268.35(d), 268.36, 268.42(d)]

Not applicable to this Facility.

C-3a(5) Leachates

[40 CFR 260.10, 268.35(a)]

Not applicable to this Facility.

C-3a(6) Lab Packs

[40 CFR 268.7(a)(7), 268.7(a)(8), 268.42(c), Part 268 Appendix IV, Part 268 Appendix V]

Not applicable to this Facility.

C-3a(7) Contaminated Debris

[40 CFR 268.2(g), 268.7, 268.9, 268.36, 268.45, 270.13(n)]

Not applicable to this Facility.

C-3a(8) Waste Mixtures and Wastes with Overlapping Requirements
[40 CFR 264.13(a), 268.7, 268.41(b), 268.43(b), 268.45(a)]

Generator process knowledge and analytical data will be used to demonstrate that waste mixtures, and wastes carrying multiple waste codes, are properly characterized. Wastes that carry more than one characteristic or listed waste code will be identified with the waste code having the most stringent treatment requirement. Similarly wastes that have been combined for treatment purposes will be identified with the waste code having the most stringent treatment standard.

C-3a(9) Dilution and Aggregation of Wastes
[40 CFR 268.3]

Aggregation of waste at the Facility will only occur to combine/commingle compatible wastes prior to transportation to a permitted facility. Aggregation of waste will not be used to dilute wastes in order to comply with different treatment standards.

C-3b NOTIFICATION, CERTIFICATION, AND RECORDKEEPING REQUIREMENTS
[40 CFR 264.73, 268.7,268.9(d)]

C-3b(1) Retention of Generator Notices and Certifications
[40 CFR 268.7(a)]

Detrex Corporation will retain a copy of all notices, certifications, demonstrations, data, and other documentation, including LDRFs, for the specified time periods.

C-3b(2) Notification and Certification Requirements for Treatment Facilities
[40 CFR 268.7(b)]

No chemical or physical treatment of wastes is conducted at the Site. The wastes are eventually transported to a properly permitted off site facility and are accompanied by all appropriate notifications and certifications. The LDRs are prepared by Detrex Corporation based upon the LDRs provided by the original generator(s).

C-3b(3) Notification and Certification Requirements for Land Disposal Facilities
[40 CFR 268.7(c)(1)]

Not applicable to this Facility.

C-3b(4) Waste Shipped to Subtitle C Facilities
[40 CFR 268.7(a), 268.7(b)(6)]

All waste shipments from the Detrex facility to a permitted off-site facility will be accompanied by the appropriate notifications and certifications. Detrex Corporation will prepare the notifications/certifications from the information provided by the original generator(s).

C-3b(5) Waste Shipped to Subtitle D Facilities
[40 CFR 268.7(d), 268.9(d)]

Not applicable to this Facility.

C-3b(6) Recyclable Materials
[40 CFR 268.7(b)(7)]

Not applicable to this Facility.

C-3b(7) Recordkeeping
[40 CFR 264.73, 268.7(a)(5), 268.7(a)(6), 268.7(a)(7), 268.7(d)]

Detrex maintains a Facility Operating Log (i.e., Perpetual Log) in accordance with 40 CFR 264.73. Copies of all necessary notifications and certifications as well as relevant inspection forms and monitoring data are also maintained on file at the Facility as required by applicable regulations.

C-3c REQUIREMENTS PERTAINING TO THE STORAGE OF RESTRICTED WASTES
[40 CFR 268.50]

C-3c(1) Restricted Wastes Stored in Containers
[40 CFR 268.5(a)(2)(i)]

Section D-1 of this permit application describes the procedures followed by Detrex to manage containerized hazardous wastes at the Facility. Many of the wastes managed at the Facility are restricted wastes. In particular, all containers are clearly marked to identify their contents and date of receipt at the Facility.

C-3c(2) Restricted Wastes Stored in Tanks
[40 CFR 268.50(a)(2)(ii)]

Not applicable to this Facility.

C-3c(3) Storage of Liquid PCB Wastes
[40 CFR 268.50(f)]

Not applicable to this Facility.

C-3d EXEMPTIONS, EXTENSIONS, AND VARIANCES TO LAND DISPOSAL RESTRICTIONS

C-3d(1) Case-by-Case Extensions to an Effective Date
[40 CFR 268.5, 270.14(b)(21)]

Not applicable to this Facility.

C-3d(2) Exemption from Prohibition
[40 CFR 268.6, 270.14(b)(21)]

Not applicable to this Facility.

C-3d(3) Variance from a Treatment Standard
[40 CFR 268.44]

Not applicable to this Facility.

C-3d(4) Requirements for Surface Impoundments Exempted from Land Disposal Restrictions
[40 CFR 268.4, 264.13(b)(7), 268.14]

Not applicable to this Facility

ATTACHMENT C-1

LIST OF ACCEPTABLE HAZARDOUS WASTES

Date: 04/30/02
Revision: 02-1

ATTACHEMNT I-1

LIST OF HAZARDOUS WASTES

Waste	*EPA Hazardous Waste Number and Hazard Code*
Tetrachloroethylene	**F001 (T), F002 (T), D039 (T), U210 (T)**
Trichloroethylene	**F001 (T), F002 (T), D040 (T), U228 (T)**
1,1,1-Trichloroethane (Methyl chloroform)	**F001 (T), F002 (T), U226 (T)**
Dichloromethane	**F001 (T), F002 (T), U080 (T)**
Trichlorofluoromethane	**F001 (T), F002 (T), U121 (T)**
Arsenic	*D004 (T)*
Barium	*D005 (T)*
Cadmium	*D006 (T)*
Chromium	*D007 (T)*
Lead	*D008 (T)*
Mercury	*D009 (T)*
Selenium	*D010 (T)*
Silver	*D011 (T)*
Benzene	*D018 (T)*
Carbon Tetrachloride	*D019 (T)*
Chlorobenzene	*D021 (T)*
Chloroform	*D022 (T)*
1,4-Dichlorobenzene	*D027 (T)*
1,2-Dichloroethane	*D028 (T)*
1,1-Dichloroethylene	*D029 (T)*
2,4-Dinitrotoluene	*D030 (T)*
Hexachloroethane	*D034 (T)*
Methyl Ethyl Ketone	*D035 (T)*
Pyridine	*D038 (T)*

Note:

Hazard Code based on 40 CFR 261 & may be liquid or solid.
T - Toxic Waste

Waste codes in italics represent underlying constituents and are not accepted without one of the primary waste codes as part of the waste.

ATTACHMENT C-2

MATERIAL SAFETY DATA SHEETS

MATERIAL SAFETY DATA SHEET

MSDS NUMBER 9311.8

PRODUCT NAME: METHYLENE CHLORIDE
CAS NUMBER: 75-09-2
CHEMICAL NAME: DICHLOROMETHANE
MSDS NUMBER: 9311.8

SECTION I

DETREX CORPORATION PO BOX 5111 SOUTHFIELD MI 48086-5111 EMERGENCY TELEPHONE NUMBER: (248) 799-3820 INFORMATION TELEPHONE NUMBER: (248) 358-5800 DATE PREPARED: 10/28/98 SUPERSEDES: 05/14/97	HMIS RATINGS HEALTH: 2 FIRE: 0 REACTIVITY: 0 PERSONAL PROTECTION: H NFPA HEALTH: 2 FIRE: 0 SPEC. HAZ. REACT.: 0

SECTION II - HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

CAS NUMBER	HAZARDOUS COMPONENT	NTP	ARC	SUB-PART Z	SARA 313	OSHA PEL	ACGIH TLV	OTHER LIMITS	PERCENT
75-09-2	DICHLOROMETHANE	S	S	Y	Y	25 ppm	50 ppm	125 ppm ST[1]	> 98 %
75-56-9	PROPYLENE OXIDE	S	S	Y	Y	20 ppm	20 ppm	N/E	< 2%

SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS

BOILING POINT	39.5 °C	**SPECIFIC GRAVITY (H_2O = 1)**	1.330
VAPOR PRESSURE (mm Hg)	352 @ 20 °C	**MELTING POINT**	-96.7 °C
VAPOR DENSITY (AIR = 1)	2.9	**EVAPORATION RATE (Butyl Acetate = 1)**	0.7
SOLUBILITY IN WATER: 1.32 gm/100 gm WATER AT 25 °C		**APPEARANCE AND ODOR:** CLEAR, COLORLESS LIQUID; MILDLY SWEET ODOR.	
OTHER INFORMATION: AUTO IGNITION TEMPERATURE: 615 C (1139 F) % VOLATILE: 100			

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: NONE **FLAMMABLE LIMITS:** **LEL:** 12 % **UEL:** 19 %

EXTINGUISHING MEDIA:

WATER FOG, DRY CHEMICAL, FOAM, OR CARBON DIOXIDE.

SPECIAL FIRE FIGHTING PROCEDURES:

ONLY THOSE PROPERLY TRAINED IN FIRE FIGHTING TECHNIQUES SHOULD BE ALLOWED TO FIGHT FIRES. REMOVE ALL OTHER PERSONNEL FROM THE AREA. USE POSITIVE PRESSURE, SELF-CONTAINED BREATHING APPARATUS DUE TO THERMAL DECOMPOSITION PRODUCTS. AVOID CONTACT WITH SKIN. WATER MAY BE USED TO KEEP CONTAINERS COOL.

UNUSUAL FIRE FIGHTING PROCEDURES:

CONCENTRATED VAPORS CAN BE IGNITED BY HIGH INTENSITY IGNITION SOURCES.

SECTION V - REACTIVITY DATA

STABILITY:

STABLE

HAZARDOUS DECOMPOSITION OR BY-PRODUCTS:

PRODUCTS OF DECOMPOSITION INCLUDE: CARBON MONOXIDE, CARBON DIOXIDE, CHLORINE, HYDROGEN CHLORIDE, AND POSSIBLY PHOSGENE.

HAZARDOUS POLYMERIZATION:

WILL NOT OCCUR

INCOMPATIBILITY:

CONDITIONS TO AVOID:
AVOID CONTACT WITH OPEN FLAMES, ELECTRIC ARCS, OR OTHER HOT SURFACES WHICH CAN CAUSE THERMAL DECOMPOSITION.

MATERIALS TO AVOID:
AVOID STRONG ALKALIES, OXYGEN, NITROGEN PEROXIDE, SODIUM, POTASSIUM, AND OTHER OXIDIZERS, AND REACTIVE MATERIALS.

SECTION VI - HEALTH HAZARD DATA

ROUTES OF ENTRY:

INHALATION, DERMAL, INGESTION ARE THE PRIMARY ROUTES OF ENTRY, ALTHOUGH OTHER AVENUES SHOULD BE CONSIDERED.

HEALTH HAZARDS (ACUTE AND CHRONIC):

ACUTE:

METHYLENE CHLORIDE:
MATERIAL MAY BE MODERATELY TOXIC BY INGESTION, SUBCUTANEOUS, AND INTRAPERITIONAL ROUTES. MILDLY TOXIC BY INHALATION. POISON BY INTERVENOUS ROUTES. EXPERIMENTAL REPRODUCTIVE EFFECTS. CARBOXYHEMOGLOBIN LEVELS CAN BE ELEVATED IN PERSONS EXPOSED TO METHYLENE CHLORIDE AND CAUSE A SUBSTANTIAL STRESS ON THE CARDIOVASCULAR SYSTEM. THIS ELEVATION CAN BE ADDITIVE TO THE INCREASE CAUSED BY SMOKING AND OTHER CARBON MONOXIDE SOURCES. CONSUMPTION OF ALCOHOLIC BEVERAGES MAY INCREASE THE POTENTIAL FOR DEVELOPMENT OF TOXIC EFFECTS RESULTING FROM EXPOSURE TO THIS PRODUCT.

PROPYLENE OXIDE:
POISON BY INTRAPERITIONAL ROUTE. MODERATELY TOXIC BY INGESTION, INHALATION, AND SKIN CONTACT. AN EXPERIMENTAL TERATOGEN. SEVERE EYE AND SKIN IRRITANT.
AS A PURE SUBSTANCE, HAS CAUSED ALLERGIC REACTIONS IF REPEATED CONTACT OCCURS.

HEALTH HAZARDS (ACUTE AND CHRONIC-CONTINUED):

CHRONIC:

METHYLENE CHLORIDE:
CHRONIC EXPOSURE HAS CAUSED LIVER AND KIDNEY EFFECTS IN EXPERIMENTAL ANIMALS. INHALATION STUDIES AT CONCENTRATIONS OF 2,000 AND 4,000 ppm SHOWS INCREASED INCIDENCE OF MALIGNANT LIVER AND LUNG TUMORS IN MICE. THREE INHALATION STUDIES OF RATS HAVE SHOWN INCREASED INCIDENCE OF BENIGN MAMMARY GLAND TUMORS IN FEMALE RATS AT CONCENTRATIONS OF 500 ppm AND ABOVE AND INCREASES IN BENIGN GLAND TUMORS IN MALES AT CONCENTRATIONS OF 1,500 ppm AND ABOVE. RATS EXPOSED TO 50 AND 200 ppm VIA INHALATION SHOWED NO INCREASE INCIDENCE OF TUMORS. MICE AND RATS EXPOSED BY INGESTION TO LEVELS UP TO 250 mg/DAY LIFETIME AND HAMSTERS

EXPOSED VIA INHALATION TO CONCENTRATIONS UP TO 3,500 ppm LIFETIME DID NOT SHOW AN INCREASE OF TUMORS.
THE IARC HAS CONCLUDED THAT THERE IS SUFFICIENT EVIDENCE FOR THE CARCINOGENICITY OF METHYLENE CHLORIDE TO EXPERIMENTAL ANIMALS, AND INADEQUATE EVIDENCE FOR THE CARCIOGENICITITY TO HUMANS, RESULTING IN A CLASSIFICATION OF AN A2 CARCINOGEN.
EPIDEMILOGY STUDIES OF 751 HUMANS EXPOSED TO METHYLENE CHLORIDE, IN THE WORKPLACE OF WHICH 252 WERE EXPOSED FOR A MINIMUM OF 20 YEARS DID NOT DEMONSTRATE ANY INCREASE IN DEATHS CAUSED BY CANCER OR CARDIAC PROBLEMS. A SECOND STUDY 0F 2,227 WORKERS CONFIRMED THE SAME RESULTS.
REPRODUCTIVE TOXICITY STUDIES HAVE BEEN CONDUCTED TO EVALUATE THE POTENTIAL ADVERSE EFFECTS METHYLENE CHLORIDE MAY HAVE ON REPRODUCTIVE AND OFF-SPRING OF LABORATORY ANIMALS. THE RESULTS INDICATED THAT METHYLENE CHLORIDE DOES NOT CAUSE BIRTH DEFECTS IN LABORATORY ANIMALS.

PROPYLENE OXIDE:
IARC HAS GIVEN THIS MATERIAL AN A2 CLASSIFICATION. THE NTP HAS SHOWN EVIDENCE FOR RATS AND CLEAR EVIDENCE FOR MICE.
MATERIAL HAS CAUSED INCREASED INCIDENCE OF NASAL TUMORS IN RATS EXPOSED BY INHALATION, FORE-STOMACH TUMORS IN RATS EXPOSED BY GAVAGE (FORCED-FED-IN-OIL) AND INJECTION TO SITE TUMORS WHEN INJECTED UNDER THE SKIN OF RATS.

SIGNS AND SYMPTOMS OF EXPOSURE:

METHYLENE CHLORIDE:
INHALATION:
AFFECTS VARY WITH CONCENTRATION. AT 900-1000 ppm DIZZINESS CAN OCCUR. CONCENTRATIONS ABOVE 2000 ppm CAUSE HEADACHES, NAUSEA, AND VOMITING. CONCENTRATIONS ABOVE 7000 ppm CAUSE TINGLING AND NUMBNESS IN THE ARMS AND LEGS WITH RAPID HEARTBEAT. LOSS OF CONSCIOUSNESS AND DEATH OCCURRED AT CONCENTRATIONS IN EXCESS OF 9000 ppm, IF EXPOSURE IS PROLONGED.

SKIN:
PROLONGED OR REPEATED CONTACT MAY CAUSE IRRITATION, DEFATTING OF SKIN, AND DERMATITIS.

EYES:
MAY CAUSE IRRITATION AND TEMPORARY CORNEAL INJURY. VAPORS MAY ALSO BE IRRITATING TO THE EYES.

INGESTION:
MAY CAUSE DIARRHEA, NAUSEA, HALLUCINATIONS, PARESTHESIA, SOMNEOLENCE, ALTERED SLEEP TIME, CONVULSIONS, EUPHORIA, CHANGE IN HEART RATE AND HYPERMOBILITY. ASPIRATION DUE TO VOMITING MAY CAUSE CHEMICAL PNEUMONIA AND SYSTEMIC EFFECTS.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE:

ALCOHOLISM, ACUTE AND CHRONIC LIVER AND KIDNEY DISEASE, CHRONIC LUNG DISEASE, ANEMIA, CORONARY DISEASE, OR RHYTHM DISORDERS OF THE HEART.

EMERGENCY AND FIRST AID PROCEDURES:

INHALATION:
REMOVE INDIVIDUAL TO FRESH AIR. IF BREATHING IS DIFFICULT PROVIDE OXYGEN. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION, PREFERABLY MOUTH-TO-MOUTH. CONSULT A PHYSICIAN.

SKIN:
REMOVE CONTAMINATED CLOTHES AND LAUNDER PRIOR TO REUSE. DISCARD ALL LEATHER ARTICLES SOAKED WITH PRODUCT. WASH EXPOSED AREAS WITH SOAP AND WATER FOR AT LEAST 15 MINUTES.

EYES:
FLUSH IMMEDIATELY WITH COPIOUS AMOUNTS OF WATER FOR AT LEAST 15 MINUTES. SEEK MEDICAL ATTENTION.

OTHER HEALTH WARNINGS:

INGESTION:
DO NOT INDUCE VOMITING. IF VOMITING SHOULD OCCUR SPONTANEOUSLY, KEEP INDIVIDUALS HEAD BELOW THEIR HIPS TO PREVENT ASPIRATION OF MATERIAL INTO THE LUNGS. SEEK MEDICAL ATTENTION IMMEDIATELY.

NOTE TO PHYSICIAN:
ADRENALINE SHOULD NEVER BE GIVEN TO PERSONS OVEREXPOSED TO METHYLENE CHLORIDE. THE FINDING OF CHRONIC TOXIC EFFECTS IN LABORATORY ANIMALS MAY INDICATE TOXICITY TO HUMANS.

	DICHLOROMETHANE	PROPYLENE OXIDE
LD50 (DERMAL-RAB.):	N/D	N/D
LD50 (ORAL-RAT):	1,600 mg/Kg	380 mg/Kg
LC50 (INHALATION-RAT):	8,800 mg/m^3/30M	4000 ppm/4H
MUTAGENIC:	N/D	N/D

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:

IMMEDIATELY EVACUATE THE AREA AND PROVIDE MAXIMUM VENTILATION. UNPROTECTED PERSONNEL SHOULD MOVE UPWIND OF THE SPILL. ONLY PERSONNEL EQUIPPED WITH PROPER RESPIRATORY AND SKIN/EYE PROTECTION SHOULD BE PERMITTED IN THE AREA. DIKE AREA TO CONTAIN THE SPILL. TAKE PRECAUTIONS AS NECESSARY TO PREVENT CONTAMINATION OF THE GROUND AND SURFACE WATERS. RECOVER SPILLED MATERIAL ON ABSORBENTS, SUCH AS SAWDUST OR VERMICULITE, AND SWEEP INTO CLOSED CONTAINERS FOR DISPOSAL. AFTER ALL VISIBLE TRACES, INCLUDING VAPORS, HAVE BEEN REMOVED, THOROUGHLY WET VACUUM THE AREA. DO NOT FLUSH TO THE SEWER. IF AREA IS POROUS, REMOVE AS MUCH EARTH AND GRAVEL, ETC., AS NECESSARY AND PLACE IN CLOSED CONTAINERS FOR DISPOSAL.

WASTE DISPOSAL METHOD:

CONTAMINATED SAWDUST, VERMICULITE OR POROUS SURFACE MUST BE DISPOSED OF IN A PERMITTED HAZARDOUS WASTE MANAGEMENT FACILITY. RECOVERED LIQUIDS MAY BE REPROCESSED OR INCINERATED, OR MUST BE TREATED IN A PERMITTED HAZARDOUS WASTE MANAGEMENT FACILITY. CARE MUST BE TAKEN WHEN USING OR DISPOSING OF CHEMICAL MATERIALS AND/OR THEIR CONTAINERS IN ACCORDANCE WITH THE CLEAN AIR ACT, THE CLEAN WATER ACT, THE RESOURCE CONSERVATION AND

WASTE DISPOSAL METHOD (cont.):

RECOVERY ACT, THE DEPARTMENT OF TRANSPORTATION, AS WELL AS ANY OTHER RELEVANT FEDERAL, STATE, OR LOCAL LAWS/REGULATIONS REGARDING DISPOSAL.

POSSIBLE WASTE DISPOSAL CODES: F001, F002

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:

-DO NOT USE IN POORLY VENTILATED OR CONFINED SPACES WITHOUT PROPER RESPIRATORY PROTECTION.
-KEEP CONTAINER CLOSED WHEN NOT IN USE.
-STORE ONLY IN CLOSED, PROPERLY LABELED CONTAINERS.
-THIS MATERIAL OR ITS VAPORS WHEN IN CONTACT WITH FLAMES, HOT GLOWING SURFACES OR ELECTRIC ARCS CAN DECOMPOSE TO FORM HYDROGEN CHLORIDE, CHLORINE, AND OTHER TOXIC COMPOUNDS.
-DO NOT USE CUTTING OR WELDING TORCHES ON DRUMS THAT CONTAINED PRODUCT UNLESS PROPERLY PURGED AND CLEANED.

OTHER PRECAUTIONS:

-DO NOT BREATHE VAPORS. HIGH CONCENTRATIONS CAN CAUSE DIZZINESS, UNCONSCIOUSNESS, OR DEATH IN EXTREME CASES. VENTILATION MUST BE SUFFICIENT TO LIMIT EMPLOYEES' EXPOSURE.
-AVOID CONTACT WITH EYES OR SKIN; DO NOT INGEST.
-DO NOT EAT, DRINK OR SMOKE IN WORK AREAS.

OTHER PRECAUTIONS (CONTINUED):

-STORE MATERIAL IN COOL, DRY, WELL-VENTILATED AREAS OUT OF SUNLIGHT. PREVENT WATER OR MOISTURE FROM ENTERING STORAGE TANKS OR CONTAINERS.
-DO NOT EAT, DRINK OR SMOKE IN WORK AREAS.

SECTION VIII - CONTROL MEASURES

VENTILATION REQUIREMENTS:

USE LOCAL VENTILATION OR DILUTION AS APPROPRIATE TO CONTROL EXPOSURES TO BELOW PERMISSIBLE LIMITS.

PERSONAL PROTECTIVE EQUIPMENT:

RESPIRATORY PROTECTION:
TO LIMIT EMPLOYEES' EXPOSURE, OSHA REQUIRES THAT THE USE OF ADMINISTRATIVE OR ENGINEERING CONTROLS MUST FIRST BE DEVELOPED AND IMPLEMENTED WHENEVER FEASIBLE (29 CFR 1910.1000(e)). WHEN CONTROLS ARE NOT FEASIBLE THEN PROTECTIVE EQUIPMENT, SUCH AS RESPIRATORS, MAY BE USED. HALF OR FULL FACE RESPIRATORS IN CONJUNCTION WITH THE PROPER CHEMICAL CARTRIDGE MAY BE USED WHEN CONDITIONS DO NOT EXCEED PERMISSIBLE LIMITS. POSITIVE PRESSURE, SELF-CONTAINED UNITS (SCBAs) ARE REQUIRED WHENEVER: THERE IS INSUFFICIENT OXYGEN, POORLY VENTILATED ROOMS, CONDITIONS ARE IDLH, OR WHEN EXPOSURE IS ABOVE THE PEL, AND SOME CONFINED-SPACE CONDITIONS. USE ONLY OSHA/NIOSH APPROVED RESPIRATORS ACCORDING TO THE MANUFACTURER'S DIRECTIONS AND THE PROVISIONS UNDER 29 CFR 1910.134.

EYE PROTECTION:
SPLASHPROOF GOGGLES

DERMAL PROTECTION:
PROTECT ALL EXPOSED SKIN FROM LIQUID CONTACT. USE SYNTHETIC GLOVES SUCH AS VITON, POLYVINYL ALCOHOL (DEGRADES IN WATER) OR THE EQUIVALENT. APRONS SHOULD BE USED WHEN THERE IS A CHANCE FOR SPLASHING.

OTHER:
EYEWASH AND SAFETY SHOWERS SHOULD BE AVAILABLE IN AREAS WHERE THIS PRODUCT IS HANDLED.

SECTION IX - ADDITIONAL INFORMATION

ADDITIONAL MANUFACTURER WARNINGS:

-DO NOT USE IN POORLY VENTILATED OR CONFINED-SPACES WITHOUT PROPER RESPIRATORY PROTECTION.
-KEEP CONTAINER CLOSED WHEN NOT IN USE.
-REUSE OF CONTAINERS MUST MEET WITH ALL APPLICABLE OSHA, DOT, AND EPA REGULATIONS.
-THIS MATERIAL OR ITS VAPORS WHEN IN CONTACT WITH FLAMES, HOT GLOWING SURFACES OR ELECTRIC ARCS CAN DECOMPOSE TO FORM HYDROGEN CHLORIDE, CHLORINE, AND OTHER TOXIC BY-PRODUCTS.

OTHER PRECAUTIONS AND COMMENTS:

-DO NOT BREATHE VAPORS. HIGH VAPOR CONCENTRATIONS CAN CAUSE DIZZINESS, UNCONSCIOUSNESS, AND DIRECTLY EFFECTS THE CENTRAL NERVOUS SYSTEM, THE RESPIRATORY SYSTEM AND THE HEART.
-USE ONLY WITH ADEQUATE VENTILATION. VENTILATION MUST BE ADEQUATE ENOUGH TO LIMIT EMPLOYEES' EXPOSURE.
-AVOID CONTACT WITH THE EYES AND SKIN; DO NOT INGEST.
-DO NOT EAT, DRINK, OR SMOKE IN WORK AREAS OR WHERE MATERIAL IS STORED.
-COMPONENTS OF THIS PRODUCT ARE REGULATED UNDER SECTION 313 OF SARA III.
-MATERIAL MAY TRIGGER REPORTING REQUIREMENTS UNDER SECTION 311/312 OF SARA III.
-MATERIAL IS REGISTERED UNDER TSCA INVENTORY.
-CALIFORNIA HAS LISTED METHYLENE CHLORIDE AS A KNOWN CARCINOGEN UNDER PROPOSITION 65.

-DOT INFORMATION:

PROPER SHIPPING NAME:	DICHLOROMETHANE
HAZARD CLASS:	6.1
IDENTIFICATION NUMBER:	UN 1593
PACKING GROUP:	PG III
LABELS:	KEEP AWAY FROM FOOD (6.1)
REPORTABLE QUANTITY:	454 Kg (1000 lbs.)

DETREX CORPORATION BELIEVES THE INFORMATION AND RECOMMENDATIONS CONTAINED HEREIN (INCLUDING DATA AND STATEMENTS) ARE ACCURATE AS OF THE DATE HEREOF. NO WARRANTY OF FITNESS FOR ANY PARTICULAR PURPOSE, WARRANTY OF MERCHANTABILITY, OR ANY OTHER WARRANTY, EXPRESSED OR IMPLIED, IS MADE CONCERNING THE INFORMATION PROVIDED HEREIN. THE INFORMATION PROVIDED HEREIN RELATES ONLY TO THE SPECIFIC PRODUCT DESIGNED AND MAY NOT BE VALID WHERE SUCH PRODUCT IS USED IN COMBINATION WITH ANY OTHER MATERIALS OR IN ANY PROCESS. FURTHER, SINCE THE CONDITIONS AND METHODS OF USE OF THE PRODUCT AND OF THE INFORMATION REFERRED TO HEREIN ARE BEYOND THE CONTROL OF DETREX CORPORATION, DETREX EXPRESSLY DISCLAIMS ANY AND ALL LIABILITY AS TO ANY RESULTS OBTAINED OR ARISING FROM ANY USE OF THE PRODUCT OR RELIANCE ON SUCH INFORMATION.

N/A = NOT APPLICABLE
N/D = NOT DETERMINED
N/E = NOT ESTABLISHED
S = SUSPECTED
ST = SHORT TERM EXPOSURE LIMIT : 15 MINUTES TWA.

SUPERSEDES: MSD 9311.8; REV. NOVEMBER 1994

MATERIAL SAFETY DATA SHEET

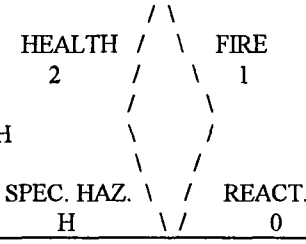
PRODUCT NAME:	DETREX PERM-ETHANE
CAS NUMBER:	NOT APPLICABLE
CHEMICAL NAME:	1,1,1-TRICHLOROETHANE, STABILIZED
MSDS NUMBER:	9311.6

SECTION I

DETREX CORPORATION
PO BOX 5111
SOUTHFIELD MI 48086-5111
EMERGENCY TELEPHONE NUMBER: (248) 799-3820
INFORMATION TELEPHONE NUMBER: (248) 358-5800
DATE PREPARED: 10/28/98
SUPERSEDES: 05/14/97

HMIS RATINGS
HEALTH: 2
FIRE: 1
REACTIVITY: 0
PERSONAL PROTECTION: H

NFPA



SECTION II - HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

CAS UMBER	HAZARDOUS COMPONENT	NTP	IARC	SUB-PART Z	SARA 313	SHA PEL	ACGIH TLV	OTHER LIMITS	PERCENT
71-55-6	METHYL CHLOROFORM	N	N	Y	Y	350 ppm	350 ppm	450 ppm ST	> 95 %
78-92-2	BUTYL ALCOHOL	N	N	Y	Y	150 ppm	100 ppm	150 ppm ST	< 2 %
646-06-0	DIOXOLANE	N	N	N	N	N/E	N/E	N/E	< 3 %

SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS

BOILING POINT	≥ 72-88 °C	**SPECIFIC GRAVITY (H2O = 1)**	1.338
VAPOR PRESSURE (mm Hg)	≥ 135 @ 25 °C	**MELTING POINT**	≥ -32.5°C
VAPOR DENSITY (AIR = 1)	≥ 4.45	**EVAPORATION RATE (Butyl Acetate = 1)**	≥ 0.35
SOLUBILITY IN WATER: STABILIZERS ARE SOLUBLE IN WATER.		**APPEARANCE AND ODOR:** CLEAR, COLORLESS LIQUID WITH ETHER LIKE ODOR	
OTHER INFORMATION: pH OF SOLUTION: 6.0-7.5 % VOLATILE: 100 %			

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: NONE **FLAMMABLE LIMITS: LEL:** 7 % **UEL:** 15 %

EXTINGUISHING MEDIA:
WATER FOG, DRY CHEMICAL, FOAM, OR CARBON DIOXIDE.

SPECIAL FIRE FIGHTING PROCEDURES:
FIREFIGHTERS SHOULD WEAR NIOSH/MSHA APPROVED POSITIVE PRESSURE SELF-CONTAINED BREATHING APPARATUS FOR POSSIBLE EXPOSURE TO TOXIC BY-PRODUCTS OF COMBUSTION AS DENOTED IN SECTION V. WATER MAY BE USED TO KEEP CONTAINERS COOL.

UNUSUAL FIRE FIGHTING PROCEDURES:
VAPORS MAY CONCENTRATE IN CONFINED OR POORLY VENTILATED AREAS WHICH THEN CAN BE IGNITED UPON CONTACT WITH A HIGH ENERGY SPARK, OPEN FLAMES, OR A HIGH INTENSITY SOURCE OF HEAT. DUE TO VAPOR DENSITY IGNITION SOURCES DISTANT FROM AREAS OF HANDLING MATERIAL NEED TO BE CONSIDERED.

SECTION V - REACTIVITY DATA

STABILITY:
STABLE

HAZARDOUS DECOMPOSITION OR BY-PRODUCTS:
PRODUCTS OF DECOMPOSITION INCLUDE: CARBON MONOXIDE, CARBON DIOXIDE, HYDROGEN CHLORIDE, CHLORINE, AND POSSIBLY TRACES OF PHOSGENE.

HAZARDOUS POLYMERIZATION:
WILL NOT OCCUR

INCOMPATIBILITY:

CONDITIONS TO AVOID:
AVOID CONTACT WITH OPEN FLAMES, ELECTRIC ARCS, OR OTHER SOURCES OF IGNITION.

MATERIALS TO AVOID:
AVOID CONTACT WITH LIQUID OXYGEN, N202, CAUSTIC SODA, CAUSTIC POTASH, OXIDIZING MATERIALS, AND ALLOYS OF ALUMINUM, MAGNESIUM, POTASSIUM, AND ZINC UNDER HIGH PRESSURES.

SECTION VI - HEALTH HAZARD DATA

ROUTES OF ENTRY:
INHALATION, DERMAL, INGESTION ARE THE PRIMARY ROUTES OF ENTRY, ALTHOUGH OTHER AVENUES SHOULD BE CONSIDERED.

HEALTH HAZARDS (ACUTE AND CHRONIC):

ACUTE:

INHALATION:
TRICHLOROETHANE (TCE) IS MODERATELY TOXIC BY INHALATION. DIOXOLANE IS MILDLY TOXIC. TCE IS PRIMARILY A CENTRAL NERVOUS SYSTEM DEPRESSANT AND MAY POSSIBLY CAUSE CENTRAL NERVOUS SYSTEM DAMAGE.

EYE/DERMAL:
TCE IS MODERATELY TOXIC VIA SKIN ABSORPTION. MATERIAL IS IRRITATING TO THE SKIN AND EYES.

INGESTION:
DIOXOLANE AND TCE ARE MODERATELY TOXIC BY INGESTION. BUTYL ALCOHOL IS MILDLY TOXIC. SWALLOWING PRODUCT MAY CAUSE IRRITATION OF THE MOUTH AND GI TRACT. VOMITING AND SUBSEQUENT ASPIRATION INTO THE LUNGS MAY LEAD TO CHEMICAL PNEUMONIA AND PULMONARY EDEMA WHICH IS A POTENTIALLY FATAL CONDITION.

CHRONIC:
THERE IS NO EVIDENCE THAT TCE CAUSES CANCER OR CAUSES BIRTH DEFECTS.

SIGNS AND SYMPTOMS OF EXPOSURE:

INHALATION:
IRRITATION OF THE RESPIRATORY SYSTEM, DIZZINESS, NAUSEA, LIGHTHEADEDNESS, HEADACHE, LOSS OF COORDINATION AND EQUILIBRIUM, UNCONSCIOUSNESS, CONJUNCTIVA IRRITATION, HALLUCINATIONS, IRRITABILITY, AGGRESSION, HYPERMOBILITY, DIARRHEA, VOMITING, POSSIBLE CENTRAL NERVOUS SYSTEM (CNS) DAMAGE, AND DEATH IN CASES OF SEVERE OVEREXPOSURE.

SIGNS AND SYMPTOMS OF EXPOSURE (continued):

EYE/DERMAL:

MAY CAUSE IRRITATION AND DERMATITIS. THE PROBLEM MAY BE ACCENTUATED BY LIQUID TRAPPED AGAINST THE SKIN BY CONTAMINATED CLOTHING AND SHOES, INCREASING THE LIKELIHOOD OF ABSORPTION.

INGESTION:

MATERIAL MAY CAUSE IRRITATION OF THE MOUTH AND GI TRACT ALONG WITH OTHER EFFECTS LISTED UNDER INHALATION.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE:

NONE NOTED

EMERGENCY AND FIRST AID PROCEDURES:

INHALATION:

REMOVE INDIVIDUAL TO FRESH AIR. IF BREATHING IS DIFFICULT PROVIDE OXYGEN. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION, PREFERABLY MOUTH-TO-MOUTH. CONSULT A PHYSICIAN.

EYE AND SKIN CONTACT:

FLUSH EYES WITH COPIOUS AMOUNTS OF WATER FOR AT LEAST 15 MINUTES. WASH SKIN WITH SOAP AND WATER FOR AT LEAST 15 MINUTES. REMOVE ALL CONTAMINATED CLOTHING AND LAUNDER PRIOR TO REUSE. PROPERLY DISCARD ALL LEATHER ARTICLES WHICH ARE SOAKED WITH PRODUCT.

INGESTION:

IF CONSCIOUS, DRINK LARGE AMOUNTS OF WATER, DO NOT INDUCE VOMITING. NEVER ADMINISTER ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. IF VOMITING OCCURS SPONTANEOUSLY KEEP INDIVIDUAL'S HEAD BELOW THEIR HIPS TO PREVENT ASPIRATION OF MATERIAL INTO THE LUNGS. SEEK MEDICAL ATTENTION; IF UNCONSCIOUS OR IN CONVULSIONS TAKE IMMEDIATELY TO THE HOSPITAL.

OTHER HEALTH WARNINGS:

	METHYL CHLOROFORM	BUTYL ALCOHOL	DIOXOLANE
LD50 (ORAL-RAT):	10.3 g/Kg	6.5 g/Kg	3.0 g/Kg
LD50 (DERMAL-RABBIT):	N/D	N/D	8.5 g/Kg
LC50 (INHALATION-RAT):	18,000 ppm/4H	N/D	20,650 mg/m^3/4H

NOTE TO PHYSICIAN:

NEVER ADMINISTER ADRENALINE FOLLOWING 1,1,1-TRICHLOROETHANE OVEREXPOSURE. INCREASED SENSITIVITY OF THE HEART TO ADRENALINE MAY BE CAUSED BY OVEREXPOSURE TO THIS MATERIAL. TCE HAS BEEN SHOWN TO BE AN EXPERIMENTAL TETRATOGEN.

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:

IMMEDIATELY EVACUATE THE AREA AND PROVIDE MAXIMUM VENTILATION. UNPROTECTED PERSONNEL SHOULD MOVE UPWIND OF THE SPILL. ONLY PERSONNEL EQUIPPED WITH PROPER RESPIRATORY AND SKIN/EYE PROTECTION SHOULD BE PERMITTED IN THE AREA. DIKE AREA TO CONTAIN THE SPILL. TAKE PRECAUTIONS AS NECESSARY TO PREVENT CONTAMINATION OF THE GROUND AND SURFACE WATERS. RECOVER SPILLED MATERIAL ON ABSORBENTS, SUCH AS SAWDUST OR VERMICULITE, AND SWEEP INTO CLOSED CONTAINERS FOR DISPOSAL. AFTER ALL VISIBLE TRACES, INCLUDING VAPORS, HAVE BEEN REMOVED, THOROUGHLY WET VACUUM THE AREA. DO NOT FLUSH TO THE SEWER. IF AREA IS POROUS, REMOVE AS MUCH EARTH AND GRAVEL, ETC., AS NECESSARY AND PLACE IN CLOSED CONTAINERS FOR DISPOSAL.

WASTE DISPOSAL METHOD:

CONTAMINATED SAWDUST, VERMICULITE OR POROUS SURFACE MUST BE DISPOSED OF IN A PERMITTED HAZARDOUS WASTE MANAGEMENT FACILITY. RECOVERED LIQUIDS MAY BE REPROCESSED OR INCINERATED, OR MUST BE TREATED IN A PERMITTED HAZARDOUS WASTE MANAGEMENT FACILITY. CARE MUST BE TAKEN WHEN USING OR DISPOSING OF CHEMICAL MATERIALS AND/OR THEIR CONTAINERS IN ACCORDANCE WITH THE CLEAN AIR ACT, THE CLEAN WATER ACT, THE RESOURCE CONSERVATION AND RECOVERY ACT, THE DEPARTMENT OF TRANSPORTATION, AS WELL AS ANY OTHER RELEVANT FEDERAL, STATE, OR LOCAL LAWS/REGULATIONS REGARDING DISPOSAL.

POSSIBLE WASTE DISPOSAL CODES: U226, F001, AND F002

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:

-DO NOT USE IN POORLY VENTILATED OR CONFINED SPACES WITHOUT PROPER RESPIRATORY PROTECTION.
-KEEP CONTAINER CLOSED WHEN NOT IN USE.
-STORE ONLY IN CLOSED, PROPERLY LABELED CONTAINERS.
-THIS MATERIAL OR ITS VAPORS WHEN IN CONTACT WITH FLAMES, HOT GLOWING SURFACES OR ELECTRIC ARCS CAN DECOMPOSE TO FORM HYDROGEN CHLORIDE, CHLORINE, AND OTHER TOXIC COMPOUNDS.
-DO NOT USE CUTTING OR WELDING TORCHES ON DRUMS THAT CONTAINED PRODUCT UNLESS PROPERLY PURGED AND CLEANED.

OTHER PRECAUTIONS:

-DO NOT BREATHE VAPORS. HIGH CONCENTRATIONS CAN CAUSE DIZZINESS, UNCONSCIOUSNESS, OR DEATH IN EXTREME CASES.
-VENTILATION MUST BE SUFFICIENT TO LIMIT EMPLOYEES' EXPOSURE.
-AVOID CONTACT WITH EYES OR SKIN; DO NOT INGEST.
-DO NOT EAT, DRINK OR SMOKE IN WORK AREAS.
-AVOID CONTAMINATION OF WATER SUPPLIES!!!!!! HANDLING, STORAGE, AND USE PROCEDURES MUST BE CAREFULLY MONITORED TO AVOID SPILLS OR LEAKS. ANY SPILL OR LEAK HAS THE POTENTIAL TO CAUSE UNDERGROUND WATER CONTAMINATION WHICH MAY, IF SUFFICIENTLY SEVERE, RENDER A DRINKING WATER SOURCE UNFIT FOR HUMAN CONSUMPTION. CONTAMINATION THAT DOES OCCUR CANNOT BE EASILY CORRECTED.
-CHLORINATED SOLVENT USED AS A FLASH POINT SUPPRESSANT MUST BE ADDED IN SUFFICIENT QUANTITY OR THE RESULTANT MIXTURE MAY HAVE A FLASH POINT LOWER THAN THE FLAMMABLE COMPONENT.

SECTION VIII - CONTROL MEASURES

VENTILATION REQUIREMENTS:

USE LOCAL VENTILATION OR DILUTION AS APPROPRIATE TO CONTROL EXPOSURES TO BELOW PERMISSIBLE LIMITS.

PERSONAL PROTECTIVE EQUIPMENT:

RESPIRATORY PROTECTION:
TO LIMIT EMPLOYEES' EXPOSURE, OSHA REQUIRES THAT THE USE OF ADMINISTRATIVE OR ENGINEERING CONTROLS MUST FIRST BE DEVELOPED AND IMPLEMENTED WHENEVER FEASIBLE (29 CFR 1910.1000(e)). WHEN CONTROLS ARE NOT FEASIBLE THEN PROTECTIVE EQUIPMENT, SUCH AS RESPIRATORS, MAY BE USED. HALF OR FULL FACE RESPIRATORS IN CONJUNCTION WITH THE PROPER CHEMICAL CARTRIDGE MAY BE USED WHEN CONDITIONS DO NOT EXCEED PERMISSIBLE LIMITS. POSITIVE PRESSURE, SELF-CONTAINED UNITS (SCBAs) ARE REQUIRED WHENEVER: THERE IS INSUFFICIENT OXYGEN, POORLY VENTILATED ROOMS, CONDITIONS ARE IDLH, OR WHEN EXPOSURE IS ABOVE THE PEL, AND SOME CONFINED-SPACE CONDITIONS. USE ONLY OSHA/NIOSH APPROVED RESPIRATORS ACCORDING TO THE MANUFACTURER'S DIRECTIONS AND THE PROVISIONS UNDER 29 CFR 1910.134.

PERSONAL PROTECTIVE EQUIPMENT (continued):

EYE PROTECTION:
SPLASHPROOF GOGGLES

DERMAL PROTECTION:
PROTECT ALL EXPOSED SKIN FROM LIQUID CONTACT. USE SYNTHETIC GLOVES SUCH AS VITON; FOR LIMITED SERVICE POLYVINYL ALCOHOL (DEGRADES IN WATER), NITRILE, BUTYL, OR NEOPRENE. APRONS AND OTHER PROTECTIVE EQUIPMENT SHOULD BE USED WHEN THERE IS A CHANCE FOR SPLASHING.

OTHER:
EYEWASH AND SAFETY SHOWERS SHOULD BE AVAILABLE IN AREAS WHERE THIS PRODUCT IS HANDLED.

SECTION IX - ADDITIONAL INFORMATION

ADDITIONAL MANUFACTURER WARNINGS:

-DO NOT USE IN POORLY VENTILATED OR CONFINED-SPACES WITHOUT PROPER RESPIRATORY PROTECTION.
-STORE ONLY IN CLOSED, PROPERLY LABELED CONTAINERS
-THIS MATERIAL OR ITS VAPORS WHEN IN CONTACT WITH FLAMES, HOT GLOWING SURFACES OR ELECTRIC ARCS CAN DECOMPOSE TO FORM HYDROGEN CHLORIDE, CHLORINE, AND OTHER TOXIC BY-PRODUCTS.
-REUSE OF CONTAINERS MUST MEET WITH ALL APPLICABLE OSHA, DOT, AND EPA REGULATIONS.

OTHER PRECAUTIONS AND COMMENTS:

-DO NOT BREATHE VAPORS. SEE SECTION VI FOR DETAILS.
-USE ONLY WITH ADEQUATE VENTILATION. VENTILATION MUST BE ADEQUATE ENOUGH TO LIMIT EMPLOYEES' EXPOSURE.
-AVOID CONTACT WITH THE EYES AND SKIN.
-DO NOT INGEST.
-DO NOT EAT, DRINK, OR SMOKE IN WORK AREAS OR WHERE MATERIAL IS STORED.
-COMPONENTS OF THIS PRODUCT ARE REGULATED UNDER SECTION 313 OF SARA III.
-USE OF THIS PRODUCT MAY TRIGGER REPORTING REQUIREMENTS UNDER SECTION 311/312 OF SARA III.
-MATERIAL IS REGISTERED UNDER TSCA INVENTORY.

-DOT INFORMATION:

PROPER SHIPPING NAME:	1,1,1-TRICHLOROETHANE
HAZARD CLASS:	6.1
IDENTIFICATION NUMBER:	UN 2831
PACKING GROUP:	PG 111
REQUIRED LABELS:	KEEP AWAY FROM FOOD (6.1)
REPORTABLE QUANTITY:	454 Kg (1000 lbs.)

CALIFORNIA PROPOSITION 65: THIS PRODUCT CONTAINS ETHYLENE DICHLORIDE AS PROCESS IMPURITIES OF LESS THAN 0.1%. THIS COMPOUND IS LISTED AS A KNOWN CARCINOGEN UNDER THIS REGULATION.

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N/E = NOT ESTABLISHEDS
N/A = NOT APPLICABLE
N/D = NOT DETERMINED
ST = SHORT TERM EXPOSURE LIMIT
S= SUSPECTED

MATERIAL SAFETY DATA SHEET

PRODUCT NAME:	DETREX PERK
CAS NUMBER:	127-18-4
CHEMICAL NAME:	TETRACHLOROETHYLENE (PERCHLOROETHYLENE)
MSDS NUMBER:	9311.7

SECTION I

DETREX CORPORATION
PO BOX 5111
SOUTHFIELD MI 48086-5111
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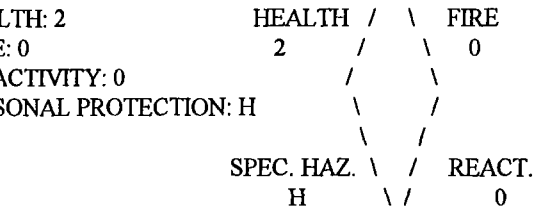

SECTION II - HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

CAS NUMBER	HAZARDOUS COMPONENT	NTP	IARC	SUB-PART Z	SARA 313	OSHA PEL	ACGIH TLV	OTHER LIMITS	PERCENT
127-18-4	TETRACHLOROETHYLENE	Y	Y	Y	Y	100 ppm	25 ppm	300 ppm ST	99 %

SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS

BOILING POINT	≥ 121°C/ 250°F	**SPECIFIC GRAVITY (H2O = 1)**	1.63
VAPOR PRESSURE (mm Hg)	≥ 14.2 @ 22°C	**MELTING POINT**	≥ -23.4 °C
VAPOR DENSITY (AIR = 1)	≥ 5.83	**EVAPORATION RATE (Butyl Acetate = 1)**	≥ 0.09
SOLUBILITY IN WATER: 0.015% @ 25 DEGREES C		**APPEARANCE AND ODOR:** CLEAR, COLORLESS LIQUI WITH ETHER-LIKE ODOR	

OTHER INFORMATION:
pH OF SOLUTION: 6.8 - 8.4
FORMULA: CCl2=CCl2
CHEMICAL FAMILY: HALOGENATED HYDROCARBONS
% VOLATILE BY VOLUME: 100

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: NONE **FLAMMABLE LIMITS: LEL:** NONE **UEL:** NONE

EXTINGUISHING MEDIA:

USE WATER, DRY CHEMICAL OR CARBON DIOXIDE.

SPECIAL FIRE FIGHTING PROCEDURES:

FIREFIGHTERS SHOULD WEAR NIOSH/MSHA APPROVED POSITIVE PRESSURE SELF-CONTAINED BREATHING APPARATUS FOR POSSIBLE EXPOSURE TO TOXIC BY-PRODUCTS OF COMBUSTION AS DENOTED IN SECTION V. WATER MAY BE USED TO KEEP CONTAINERS COOL.

UNUSUAL FIRE FIGHTING PROCEDURES:

THIS PRODUCT MAY DECOMPOSE WHEN IT COMES IN CONTACT WITH OPEN FLAMES, HEATING ELEMENTS, ELECTRICAL ARCS (SUCH AS ELECTRICAL MOTORS) OR COMBUSTION ENGINES. DUE TO VAPOR DENSITY IGNITION SOURCES DISTANT FROM AREAS OF HANDLING MATERIAL NEED TO BE CONSIDERED.

SECTION V - REACTIVITY DATA

STABILITY:

STABLE

HAZARDOUS DECOMPOSITION OR BY-PRODUCTS:

DECOMPOSITION BY-PRODUCTS INCLUDE CHLORINE, HYDROGEN CHLORIDE, CARBON MONOXIDE, CARBON DIOXIDE, AND POSSIBLE TRACES OF PHOSGENE.

HAZARDOUS POLYMERIZATION:

WILL NOT OCCUR

INCOMPATIBILITY:

CONDITIONS TO AVOID:
AVOID CONTACT WITH OPEN FLAMES, ELECTRIC ARCS, OR OTHER SOURCES OF IGNITION.

MATERIALS TO AVOID:
AVOID CONTAMINATION WITH CAUSTIC SODA, CAUSTIC POTASH, AND OXIDIZERS. SHOCK SENSITIVE MATERIALS MAY BE FORMED. ALSO AVOID CONTACT WITH BARIUM, LITHIUM, BERYLLIUM, AND N2O4.

SECTION VI - HEALTH HAZARD DATA

ROUTES OF ENTRY:

INHALATION, DERMAL, INGESTION ARE THE PRIMARY ROUTES OF ENTRY, ALTHOUGH OTHER AVENUES SHOULD BE CONSIDERED.

HEALTH HAZARDS (ACUTE AND CHRONIC):

ACUTE:

INHALATION:
MODERATELY TOXIC. PERCHLOROETHYLENE IS A CENTRAL NERVOUS SYSTEM DEPRESSANT AND CAN CAUSE POSSIBLE CENTRAL NERVOUS SYSTEM DAMAGE WITH OVEREXPOSURE. MAY CAUSE IRRITATION OF THE UPPER RESPIRATORY TRACT. FATALITIES FOLLOWING SEVERE ACUTE EXPOSURE TO VARIOUS CHLORINATED SOLVENTS HAVE BEEN ATTRIBUTED TO VENTRICULAR FIBRILLATION.

EYE/DERMAL:
EYE IRRITANT, MILDLY IRRITATING TO THE SKIN. PROLONGED EXPOSURE INVOLVING THE SKIN MAY CAUSE DERMATITIS.

INGESTION:
MILDLY TOXIC. ASPIRATION DUE TO VOMITING MAY LEAD TO CHEMICAL PNEUMONIA AND PULMONARY EDEMA WHICH IS A POTENTIALLY FATAL CONDITION. SWALLOWING MATERIAL MAY CAUSE IRRITATION TO THE MOUTH AND UPPER GI TRACT ALONG WITH OTHER EFFECTS NOTED UNDER INHALATION.

HEALTH HAZARDS (ACUTE AND CHRONIC-CONTINUED):

CHRONIC:
PROLONGED EXPOSURE ABOVE THE OSHA PERMISSIBLE EXPOSURE LIMITS MAY RESULT IN LIVER AND KIDNEY DAMAGE.
OSHA HAS DECLARED PERCHLOROETHYLENE A POTENTIAL CARCINOGEN. THIS MATERIAL HAS ALSO BEEN SHOWN (EXPERIMENTALLY) TO HAVE REPRODUCTIVE EFFECTS AND BE TETRATOGEN. MATERIAL IS LISTED AS AN ANIMAL CARCINOGEN UNDER ACGIH.

SIGNS AND SYMPTOMS OF EXPOSURE:

INHALATION:
INHALATION CAN CAUSE IRRITATION OF THE RESPIRATORY TRACT, DIZZINESS, CONJUNCTIVA IRRITATION, HALLUCINATIONS, NAUSEA, HEADACHE, LOSS OF CO-ORDINATION AND EQUILIBRIUM, UNCONSCIOUSNESS, COMA, AND IN SEVERE CASES DEATH.

EYE/DERMAL:
RASHES AND POSSIBLY DERMATITIS; PROBLEM MAY BE ACCENTUATED BY TRAPPING THE LIQUID AGAINST THE SKIN. EYE CONTACT MAY CAUSE DISCOMFORT, PAIN, AND IRRITATION.

INGESTION:
SWALLOWING OF THIS MATERIAL MAY RESULT IN IRRITATION TO THE MOUTH AND GI TRACT ALONG WITH OTHER EFFECTS AS LISTED ABOVE FOR INHALATION. PNEUMONIA AND PULMONARY EDEMA CAN RESULT FROM ASPIRATION INTO THE LUNGS.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE:

PROLONGED EXPOSURE ABOVE THE PEL/TLV MAY RESULT IN LIVER AND KIDNEY DAMAGE.

EMERGENCY AND FIRST AID PROCEDURES:

INHALATION:
REMOVE INDIVIDUAL TO FRESH AIR. IF BREATHING IS DIFFICULT PROVIDE OXYGEN. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION, PREFERABLY MOUTH-TO-MOUTH. CONSULT A PHYSICIAN.

EYE AND SKIN CONTACT:
FLUSH EYES WITH COPIOUS AMOUNTS OF WATER FOR AT LEAST 15 MINUTES. WASH SKIN WITH SOAP AND WATER FOR AT LEAST 15 MINUTES. REMOVE ALL CONTAMINATED CLOTHING AND LAUNDER PRIOR TO REUSE. PROPERLY DISCARD ALL LEATHER ARTICLES WHICH ARE SOAKED WITH PRODUCT.

INGESTION:
SEEK MEDICAL ATTENTION IMMEDIATELY! IF CONSCIOUS, DRINK LARGE AMOUNTS OF WATER, DO NOT INDUCE VOMITING. NEVER ADMINISTER ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. IF VOMITING OCCURS SPONTANEOUSLY KEEP INDIVIDUAL'S HEAD BELOW THEIR HIPS TO PREVENT ASPIRATION OF MATERIAL INTO THE LUNGS.
IF UNCONSCIOUS OR IN CONVULSIONS TAKE IMMEDIATELY TO THE HOSPITAL.

OTHER HEALTH WARNINGS:

LD50 (ORAL-RAT):	34,200 mg/m^3 / 8hr.
LD50 (DERMAL-RABBIT):	N/D
LC50 (INHALATION-RAT):	2629 mg/Kg
AQUATIC LIFE (TOXICITY):	LC50 (FISH) 96 HR. TLM 100-10 ppm

NOTE TO PHYSICIAN:
NEVER ADMINISTER ADRENALIN FOLLOWING PERCHLOROETHYLENE OVEREXPOSURE. INCREASED SENSITIVITY OF THE HEART TO ADRENALIN MAY BE CAUSED BY OVEREXPOSURE TO DETREX PERK.

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:

IMMEDIATELY EVACUATE THE AREA AND PROVIDE MAXIMUM VENTILATION. UNPROTECTED PERSONNEL SHOULD MOVE UPWIND OF THE SPILL. ONLY PERSONNEL EQUIPPED WITH PROPER RESPIRATORY AND SKIN/EYE PROTECTION SHOULD BE PERMITTED IN THE AREA. DIKE AREA TO CONTAIN THE SPILL. TAKE PRECAUTIONS AS NECESSARY TO PREVENT CONTAMINATION OF THE GROUND AND SURFACE WATERS. RECOVER SPILLED MATERIAL ON ABSORBENTS, SUCH AS SAWDUST OR VERMICULITE, AND SWEEP INTO CLOSED CONTAINERS FOR DISPOSAL. AFTER ALL VISIBLE TRACES, INCLUDING VAPORS, HAVE BEEN REMOVED, THOROUGHLY WET VACUUM THE AREA. DO NOT FLUSH TO THE SEWER. IF AREA IS POROUS, REMOVE AS MUCH EARTH AND GRAVEL, ETC., AS NECESSARY AND PLACE IN CLOSED CONTAINERS FOR DISPOSAL.

WASTE DISPOSAL METHOD:

CONTAMINATED SAWDUST, VERMICULITE OR POROUS SURFACE MUST BE DISPOSED OF IN A PERMITTED HAZARDOUS WASTE MANAGEMENT FACILITY. RECOVERED LIQUIDS MAY BE REPROCESSED OR INCINERATED, OR MUST BE TREATED IN A PERMITTED HAZARDOUS WASTE MANAGEMENT FACILITY. CARE MUST BE TAKEN WHEN USING OR DISPOSING OF CHEMICAL MATERIALS AND/OR THEIR CONTAINERS IN ACCORDANCE WITH THE CLEAN AIR ACT, THE CLEAN WATER ACT, THE RESOURCE CONSERVATION AND RECOVERY ACT, THE DEPARTMENT OF TRANSPORTATION, AS WELL AS ANY OTHER RELEVANT FEDERAL, STATE, OR LOCAL LAWS/REGULATIONS REGARDING DISPOSAL.

POSSIBLE WASTE DISPOSAL CODES: U210, F001, AND F002

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:

-DO NOT USE IN POORLY VENTILATED OR CONFINED SPACES WITHOUT PROPER RESPIRATORY PROTECTION.
-STORE ONLY IN CLOSED, PROPERLY LABELED CONTAINERS WHEN NOT IN USE.
-THIS MATERIAL OR ITS VAPORS WHEN IN CONTACT WITH FLAMES, HOT GLOWING SURFACES OR ELECTRIC ARCS CAN DECOMPOSE TO FORM HYDROGEN CHLORIDE, CHLORINE, AND OTHER TOXIC COMPOUNDS.
-DO NOT USE CUTTING OR WELDING TORCHES ON DRUMS THAT CONTAINED PRODUCT UNLESS PROPERLY PURGED AND CLEANED.

OTHER PRECAUTIONS:

-DO NOT BREATHE VAPORS. HIGH CONCENTRATIONS CAN CAUSE DIZZINESS, UNCONSCIOUSNESS, OR DEATH IN EXTREME CASES.
-VENTILATION MUST BE SUFFICIENT TO LIMIT EMPLOYEES' EXPOSURE.
-AVOID CONTACT WITH EYES OR SKIN; DO NOT INGEST.
-DO NOT EAT, DRINK OR SMOKE IN WORK AREAS.

SECTION VIII - CONTROL MEASURES

VENTILATION REQUIREMENTS:

USE LOCAL VENTILATION OR DILUTION AS APPROPRIATE TO CONTROL EXPOSURES TO BELOW PERMISSIBLE LIMITS.

PERSONAL PROTECTIVE EQUIPMENT:

RESPIRATORY PROTECTION:
TO LIMIT EMPLOYEES' EXPOSURE, OSHA REQUIRES THAT THE USE OF ADMINISTRATIVE OR ENGINEERING CONTROLS MUST FIRST BE DEVELOPED AND IMPLEMENTED WHENEVER FEASIBLE (29 CFR 1910.1000(e)). WHEN CONTROLS ARE NOT FEASIBLE THEN PROTECTIVE EQUIPMENT, SUCH AS RESPIRATORS, MAY BE USED. HALF OR FULL FACE RESPIRATORS IN CONJUNCTION WITH THE PROPER CHEMICAL CARTRIDGE MAY BE USED WHEN CONDITIONS DO NOT EXCEED PERMISSIBLE LIMITS. POSITIVE PRESSURE, SELF-CONTAINED UNITS (SCBAs) ARE REQUIRED WHENEVER: THERE IS INSUFFICIENT OXYGEN, POORLY VENTILATED ROOMS, CONDITIONS ARE IDLH, OR WHEN EXPOSURE IS ABOVE THE PEL, AND SOME CONFINED-SPACE CONDITIONS. USE ONLY OSHA/NIOSH APPROVED RESPIRATORS ACCORDING TO THE MANUFACTURER'S DIRECTIONS AND THE PROVISIONS UNDER 29 CFR 1910.134.

EYE PROTECTION:
SPLASHPROOF GOGGLES

DERMAL PROTECTION:
PROTECT ALL EXPOSED SKIN FROM LIQUID CONTACT. USE SYNTHETIC GLOVES SUCH AS VITON, POLYVINYL ALCOHOL (DEGRADES IN WATER), OR NITRILE (FOR LIMITED SERVICE). APRONS SHOULD BE USED WHEN THERE IS A CHANCE FOR SPLASHING.

OTHER:
EYEWASH AND SAFETY SHOWERS SHOULD BE AVAILABLE IN AREAS WHERE THIS PRODUCT IS HANDLED.

SECTION IX - ADDITIONAL INFORMATION

ADDITIONAL MANUFACTURER WARNINGS:

-DO NOT USE IN POORLY VENTILATED OR CONFINED-SPACES WITHOUT PROPER RESPIRATORY PROTECTION.
-THIS MATERIAL OR ITS VAPORS WHEN IN CONTACT WITH FLAMES, HOT GLOWING SURFACES OR ELECTRIC ARCS CAN DECOMPOSE TO FORM HYDROGEN CHLORIDE, CHLORINE, CARBON DIOXIDE, CARBON MONOXIDE, AND OTHER TOXIC BY-PRODUCTS INCLUDING POSSIBLY PHOSGENE.
-KEEP MATERIAL IN CLOSED, PROPERLY LABELED CONTAINERS
-AVOID CONTAMINATION OF WATER SUPPLIES. HANDLING, STORAGE, AND USE PROCEDURES MUST BE CAREFULLY MONITORED TO AVOID SPILLS OR LEAKS. ANY SPILL OR LEAK HAS THE POTENTIAL TO CAUSE UNDERGROUND WATER CONTAMINATION WHICH MAY, IF SUFFICIENTLY SEVERE, RENDER A DRINKING WATER SOURCE UNFIT FOR HUMAN CONSUMPTION. CONTAMINATION WHICH OCCURS CAN NOT BE EASILY CORRECTED.
-REUSE OF CONTAINERS MUST MEET WITH ALL APPLICABLE OSHA, DOT, AND EPA REGULATIONS.

OTHER PRECAUTIONS AND COMMENTS:

-DO NOT BREATHE VAPORS. HIGH VAPOR CONCENTRATIONS CAN CAUSE DIZZINESS, UNCONSCIOUSNESS, AND DIRECTLY EFFECTS THE CENTRAL NERVOUS SYSTEM, THE RESPIRATORY SYSTEM AND THE HEART.
-USE ONLY WITH ADEQUATE VENTILATION. VENTILATION MUST BE ADEQUATE ENOUGH TO LIMIT EMPLOYEES' EXPOSURE.
-AVOID CONTACT WITH THE EYES AND SKIN.
-DO NOT INGEST.
-DO NOT EAT, DRINK, OR SMOKE IN WORK AREAS OR WHERE MATERIAL IS STORED.
-MATERIAL IS REGULATED UNDER SECTION 313 OF SARA III.
-MATERIAL MAY TRIGGER REPORTING REQUIREMENTS UNDER SECTION 311/312 OF SARA III.
-MATERIAL IS REGISTERED UNDER TSCA INVENTORY.
-TOXIC TO AQUATIC ORGANISMS
-PERK IS LISTED IN 40 CFR 302.4 AS A HAZARDOUS SUBSTANCE.

-DOT INFORMATION:

PROPER SHIPPING NAME:	TETRACHLOROETHYLENE
HAZARD CLASS:	6.1
IDENTIFICATION NUMBER:	UN 1897
PACKING GROUP:	PG III
LABELS:	KEEP AWAY FROM FOOD (6.1)
OTHER:	MARINE POLLUTANT

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N/A = NOT APPLICABLE
N/D = NOT DETERMINED
N/E = NOT ESTABLISHED
S = SUSPECTED
ST = SHORT TERM EXPOSURE LIMIT: 5 MINUTES IN ANY 3 HRS.

MATERIAL SAFETY DATA SHEET

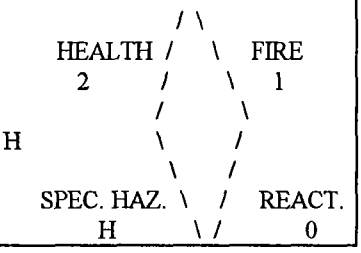
PRODUCT NAME: DETREX PERM-A-CHLOR
CAS NUMBER: 79-01-6
CHEMICAL NAME: TRICHLOROETHYLENE
MSDS NUMBER: 9311.5

SECTION I

DETREX CORPORATION
P.O. BOX 5111
SOUTHFIELD MI 48086-5111
EMERGENCY TELEPHONE NUMBER: (248) 799-3820
INFORMATION TELEPHONE NUMBER: (248) 358-5800
DATE PREPARED: 10/28/98
SUPERSEDES: 05/14/97

HMIS RATINGS
HEALTH: 2
FIRE: 1
REACTIVITY: 0
PERSONAL PROTECTION: H

NFPA



SECTION II - HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

CAS NUMBER	HAZARDOUS COMPONENT	TP	IARC	SUB-PART Z	SARA 313	OSHA PEL	ACGIH TLV	OTHER LIMITS	PERCENT
79-01-6	TRICHLOROETHYLENE	S	S	Y	Y	100 ppm	50 ppm	300 ppm ST	100

SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS

BOILING POINT	≥ 86-88 °C	**SPECIFIC GRAVITY (H2O = 1)**	1.465
VAPOR PRESSURE (mm Hg)	≥ 58 @ 20 °C	**MELTING POINT**	- 86.8 °C
VAPOR DENSITY (AIR = 1)	≥ 4.54	**EVAPORATION RATE (Butyl Acetate = 1)**	≥ 0.28
SOLUBILITY IN WATER: 0.11 % @ 25 °C		**APPEARANCE AND ODOR:** CLEAR, COLORLESS LIQUID WITH ETHER-LIKE ODOR	

OTHER INFORMATION:
pH OF SOLUTIONS: 6.7-7.5
% VOLATILE: 100 %
AUTOIGNITION TEMP: 420 °C

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: NONE **FLAMMABLE LIMITS: LEL:** 7.8% **UEL:** 52%

EXTINGUISHING MEDIA:
WATER FOG, DRY CHEMICAL, FOAM, OR CARBON DIOXIDE.

SPECIAL FIRE FIGHTING PROCEDURES:
FIREFIGHTERS SHOULD WEAR NIOSH/MSHA APPROVED POSITIVE PRESSURE SELF-CONTAINED BREATHING APPARATUS FOR POSSIBLE EXPOSURE TO TOXIC BY-PRODUCTS OF COMBUSTION AS DENOTED IN SECTION V. WATER MAY BE USED TO KEEP CONTAINERS COOL.

UNUSUAL FIRE FIGHTING PROCEDURES:
THIS PRODUCT MAY DECOMPOSE WHEN IT COMES IN CONTACT WITH OPEN FLAMES, HEATING ELEMENTS, ELECTRICAL ARCS (SUCH AS ELECTRICAL MOTORS) OR COMBUSTION ENGINES. SOME MIXTURES OF HCFCs AND CFCs UNDER THE RIGHT CONDITIONS MAY BE COMBUSTIBLE IF EXPOSED TO EXTREME HEAT OR OPEN

UNUSUAL FIRE FIGHTING PROCEDURES (CONTIN.):

FLAMES. DUE TO VAPOR DENSITY IGNITION SOURCES DISTANT FROM AREAS OF HANDLING MATERIAL NEED TO BE CONSIDERED.

SECTION V - REACTIVITY DATA

STABILITY:

STABLE

HAZARDOUS DECOMPOSITION OR BY-PRODUCTS:

PRODUCTS OF DECOMPOSITION INCLUDE: HYDROGEN CHLORIDE, CARBON MONOXIDE, CARBON DIOXIDE, CHLORINE, PHOSGENE, AND POSSIBLY OTHER UNIDENTIFIED ORGANIC COMPOUNDS.

HAZARDOUS POLYMERIZATION:

WILL NOT OCCUR

INCOMPATIBILITY:

CONDITIONS TO AVOID:
AVOID CONTACT WITH OPEN FLAMES, ELECTRIC ARCS, OR OTHER SOURCES OF IGNITION.

MATERIALS TO AVOID:
STRONG ALKALIS AND OXIDIZERS, FINELY DIVIDED METALS SUCH AS ALUMINUM, MAGNESIUM, OR ZINC.

SECTION VI - HEALTH HAZARD DATA

ROUTES OF ENTRY:

INHALATION, DERMAL, INGESTION ARE THE PRIMARY ROUTES OF ENTRY, ALTHOUGH OTHER AVENUES SHOULD BE CONSIDERED.

HEALTH HAZARDS (ACUTE AND CHRONIC):

ACUTE:

INHALATION:
MILDLY TOXIC. PRODUCT IS A CENTRAL NERVOUS SYSTEM DEPRESSANT WHICH CAN CAUSE IRRITATION OF THE RESPIRATORY TRACT. FATALITIES FOLLOWING SEVERE ACUTE EXPOSURE HAVE BEEN ATTRIBUTED TO VENTRICULAR FIBRILLATION RESULTING IN CARDIAC FAILURES. FORMS OF ADDICTION HAVE BEEN OBSERVED IN EXPOSED WORKERS.

EYE/DERMAL:
SEVERE SKIN AND EYE IRRITANT. LIQUID SPLASHED INTO THE EYE CAN RESULT IN DISCOMFORT, PAIN, AND IRRITATION. PROLONGED OR REPEATED CONTACT WITH LIQUID ON THE SKIN CAN CAUSE IRRITATION AND DERMATITIS. THE PROBLEM MAY BE ACCENTUATED BY LIQUID BECOMING TRAPPED AGAINST THE SKIN BY CONTAMINATED CLOTHING AND SHOES, INCREASING THE LIKELIHOOD OF SKIN ABSORPTION.

INGESTION:
MILD TO MODERATELY TOXIC BY INGESTION. SWALLOWING THIS MATERIAL MAY RESULT IN IRRITATION OF THE MOUTH AND GI TRACT ALONG WITH OTHER EFFECTS AS LISTED UNDER INHALATION. VOMITING AND SUBSEQUENT ASPIRATION INTO THE LUNGS MAY LEAD TO CHEMICAL PNEUMONIA AND PULMONARY EDEMA WHICH IS A POTENTIALLY FATAL CONDITION.

HEALTH HAZARDS (ACUTE AND CHRONIC) CONTINUED:

CHRONIC:
PROLONGED EXPOSURE ABOVE THE OSHA PEL MAY RESULT IN LIVER AND KIDNEY DAMAGE. TRICHLOROETHYLENE HAS BEEN EXTENSIVELY STUDIED FOR CHRONIC EFFECTS ON ANIMALS. TRICHLOROETHYLENE HAS BEEN FOUND TO HAVE EXPERIMENTAL TUMORIGENIC AND TETRATOGENIC EFFECTS. THERE IS NO EVIDENCE THAT EXPOSURE TO TRICHLOROETHYLENE PRODUCES CANCER IN HUMANS. LISTED AS A 2A BY IARC BUT IS NOT LISTED UNDER NTP OR OSHA AS A CARCINOGEN OR POTENTIAL CARCINOGEN.

SIGNS AND SYMPTOMS OF EXPOSURE:

INHALATION:
MAY CAUSE IRRITATION OF THE RESPIRATORY TRACT, DIZZINESS, NAUSEA, JAUNDICE, HEADACHES, LOSS OF COORDINATION AND EQUILIBRIUM, POSSIBLE NERVOUS SYSTEM DAMAGE, AND DEATH FROM SEVERE OVEREXPOSURE (CONFINED SPACES OR POORLY VENTILATED AREAS).

EYE/DERMAL:
VAPORS OR LIQUID MAY CAUSE IRRITATION, PAIN AND DISCOMFORT. PROLONGED OR REPEATED DERMAL CONTACT CAN CAUSE IRRITATION AND DERMATITIS. THE PROBLEM MAY BE ACCENTUATED BY LIQUID BECOMING TRAPPED AGAINST THE SKIN BY CONTAMINATED CLOTHING AND SHOES, INCREASING THE LIKELIHOOD OF ABSORPTION.

INGESTION:
MAY CAUSE IRRITATION OF THE MOUTH AND GI TRACT ALONG WITH OTHER EFFECTS NOTED UNDER INHALATION. VOMITING AND SUBSEQUENT ASPIRATION INTO THE LUNGS MAY LEAD TO CHEMICAL PNEUMONIA AND PULMONARY ADEMA WHICH IS A POTENTIALLY FATAL CONDITION.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE:

NONE NOTED

EMERGENCY AND FIRST AID PROCEDURES:

INHALATION:
REMOVE INDIVIDUAL TO FRESH AIR. IF BREATHING IS DIFFICULT PROVIDE OXYGEN. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION, PREFERABLY MOUTH-TO-MOUTH. CONSULT A PHYSICIAN.

EYE AND SKIN CONTACT:
FLUSH EYES WITH COPIOUS AMOUNTS OF WATER FOR AT LEAST 15 MINUTES. WASH SKIN WITH SOAP AND WATER FOR AT LEAST 15 MINUTES. REMOVE ALL CONTAMINATED CLOTHING AND LAUNDER PRIOR TO REUSE. PROPERLY DISCARD ALL LEATHER ARTICLES WHICH ARE SOAKED WITH PRODUCT.

INGESTION:
IF CONSCIOUS, DRINK LARGE AMOUNTS OF WATER (AT LEAST ONE QUART), DO NOT INDUCE VOMITING. NEVER ADMINISTER ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. IF VOMITING OCCURS SPONTANEOUSLY KEEP INDIVIDUAL'S HEAD BELOW THEIR HIPS TO PREVENT ASPIRATION OF MATERIAL INTO THE LUNGS. SEEK MEDICAL ATTENTION; IF UNCONSCIOUS OR IN CONVULSIONS TAKE IMMEDIATELY TO THE HOSPITAL.

OTHER HEALTH WARNINGS:

	TRICHLOROETHYLENE
LD50 (ORAL-RAT):	4,900 - 7,300 mg/Kg
LD50 (DERMAL-RABBIT):	NOT DETERMINED
LC50 (INHALATION-RAT):	25,700 ppm/ 1 Hr. :: 8,000 ppm / 4 Hr.
LC50 (SHEEPSHEAD MINNOWS):	52 mg/l/96 hr (SLIGHTLY TOXIC)
LC50 (MYSID SHRIMP):	14 mg/l/96 hr " "
LC50 (MARINE ALGA):	95 mg/l/96 hr " "

OTHER HEALTH WARNINGS (CONTIN.):

NOTE TO PHYSICIAN:

NEVER ADMINISTER ADRENALINE FOLLOWING TRICHLOROETHYLENE EXPOSURE. INCREASED SENSITIVITY OF THE HEART TO ADRENALINE MAY BE CAUSED BY OVEREXPOSURE.

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:

IMMEDIATELY EVACUATE THE AREA AND PROVIDE MAXIMUM VENTILATION. UNPROTECTED PERSONNEL SHOULD MOVE UPWIND OF THE SPILL. ONLY PERSONNEL EQUIPPED WITH PROPER RESPIRATORY AND SKIN/EYE PROTECTION SHOULD BE PERMITTED IN THE AREA. DIKE AREA TO CONTAIN THE SPILL. TAKE PRECAUTIONS AS NECESSARY TO PREVENT CONTAMINATION OF THE GROUND AND SURFACE WATERS. RECOVER SPILLED MATERIAL ON ABSORBENTS, SUCH AS SAWDUST OR VERMICULITE, AND SWEEP INTO CLOSED CONTAINERS FOR DISPOSAL. AFTER ALL VISIBLE TRACES, INCLUDING VAPORS, HAVE BEEN REMOVED, THOROUGHLY WET VACUUM THE AREA. DO NOT FLUSH TO THE SEWER. IF AREA IS POROUS, REMOVE AS MUCH EARTH AND GRAVEL, ETC., AS NECESSARY AND PLACE IN CLOSED CONTAINERS FOR DISPOSAL.

WASTE DISPOSAL METHOD:

CONTAMINATED SAWDUST, VERMICULITE OR POROUS SURFACE MUST BE DISPOSED OF IN A PERMITTED HAZARDOUS WASTE MANAGEMENT FACILITY. RECOVERED LIQUIDS MAY BE REPROCESSED OR INCINERATED, OR MUST BE TREATED IN A PERMITTED HAZARDOUS WASTE MANAGEMENT FACILITY. CARE MUST BE TAKEN WHEN USING OR DISPOSING OF CHEMICAL MATERIALS AND/OR THEIR CONTAINERS IN ACCORDANCE WITH THE CLEAN AIR ACT, THE CLEAN WATER ACT, THE RESOURCE CONSERVATION AND RECOVERY ACT, THE DEPARTMENT OF TRANSPORTATION, AS WELL AS ANY OTHER RELEVANT FEDERAL, STATE, OR LOCAL LAWS/REGULATIONS REGARDING DISPOSAL.

POSSIBLE WASTE DISPOSAL CODES: F001, F002, U-040

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:

-DO NOT USE IN POORLY VENTILATED OR CONFINED SPACES WITHOUT PROPER RESPIRATORY PROTECTION.
-KEEP CONTAINER CLOSED WHEN NOT IN USE.
-STORE ONLY IN CLOSED, PROPERLY LABELED CONTAINERS.
-THIS MATERIAL OR ITS VAPORS WHEN IN CONTACT WITH FLAMES, HOT GLOWING SURFACES OR ELECTRIC ARCS CAN DECOMPOSE TO FORM HYDROGEN CHLORIDE, CHLORINE, AND OTHER TOXIC COMPOUNDS.
-DO NOT USE CUTTING OR WELDING TORCHES ON DRUMS THAT CONTAINED PRODUCT UNLESS PROPERLY PURGED AND CLEANED.

OTHER PRECAUTIONS:

-DO NOT BREATHE VAPORS. HIGH CONCENTRATIONS CAN CAUSE DIZZINESS, UNCONSCIOUSNESS, OR DEATH IN EXTREME CASES.
-VENTILATION MUST BE SUFFICIENT TO LIMIT EMPLOYEES' EXPOSURE.
-AVOID CONTACT WITH EYES OR SKIN; DO NOT INGEST.
-DO NOT EAT, DRINK OR SMOKE IN WORK AREAS.
-LIQUID OXYGEN OR OTHER STRONG OXIDANTS MAY FORM EXPLOSIVE MIXTURES WITH TRICHLOROETHYLENE.

SECTION VIII - CONTROL MEASURES

VENTILATION REQUIREMENTS:

USE LOCAL VENTILATION OR DILUTION AS APPROPRIATE TO CONTROL EXPOSURES TO BELOW PERMISSIBLE LIMITS.

PERSONAL PROTECTIVE EQUIPMENT:

RESPIRATORY PROTECTION:
TO LIMIT EMPLOYEES' EXPOSURE, OSHA REQUIRES THAT THE USE OF ADMINISTRATIVE OR ENGINEERING CONTROLS MUST FIRST BE DEVELOPED AND IMPLEMENTED WHENEVER FEASIBLE (29 CFR 1910.1000(e)). WHEN CONTROLS ARE NOT FEASIBLE THEN PROTECTIVE EQUIPMENT, SUCH AS RESPIRATORS, MAY BE USED. HALF OR FULL FACE RESPIRATORS IN CONJUNCTION WITH THE PROPER CHEMICAL CARTRIDGE MAY BE USED WHEN CONDITIONS DO NOT EXCEED PERMISSIBLE LIMITS. POSITIVE PRESSURE, SELF-CONTAINED UNITS (SCBAs) ARE REQUIRED WHENEVER: THERE IS INSUFFICIENT OXYGEN, POORLY VENTILATED ROOMS, CONDITIONS ARE IDLH, OR WHEN EXPOSURE IS ABOVE THE PEL, AND SOME CONFINED-SPACE CONDITIONS. USE ONLY OSHA/NIOSH APPROVED RESPIRATORS ACCORDING TO THE MANUFACTURER'S DIRECTIONS AND THE PROVISIONS UNDER 29 CFR 1910.134.

EYE PROTECTION:
SPLASHPROOF GOGGLES

DERMAL PROTECTION:
PROTECT ALL EXPOSED SKIN FROM LIQUID CONTACT. USE SYNTHETIC GLOVES SUCH AS VITON OR POLYVINYL ALCOHOL (DEGRADES IN WATER); FOR LIMITED SERVICE NITRILE GLOVES MAY BE USED. APRONS AND OTHER PROTECTIVE EQUIPMENT SHOULD BE USED WHEN THERE IS A CHANCE FOR SPLASHING.

OTHER:
EYEWASH AND SAFETY SHOWERS SHOULD BE AVAILABLE IN AREAS WHERE THIS PRODUCT IS HANDLED.

SECTION IX - ADDITIONAL INFORMATION

ADDITIONAL MANUFACTURER WARNINGS:

-DO NOT USE IN POORLY VENTILATED OR CONFINED-SPACES WITHOUT PROPER RESPIRATORY PROTECTION.
-KEEP CONTAINER CLOSED WHEN NOT IN USE.
-REUSE OF CONTAINERS MUST MEET WITH ALL APPLICABLE OSHA, DOT, AND EPA REGULATIONS.
-THIS MATERIAL, OR ITS VAPORS, WHEN IN CONTACT WITH FLAMES, HOT GLOWING SURFACES, OR ELECTRIC ARCS CAN DECOMPOSE TO FORM HYDROGEN CHLORIDE, CHLORINE, AND OTHER TOXIC BY-PRODUCTS.

OTHER PRECAUTIONS AND COMMENTS:

-DO NOT BREATHE VAPORS. SEE EFFECTS UNDER SECTION VI.
-USE ONLY WITH ADEQUATE VENTILATION. VENTILATION MUST BE ADEQUATE ENOUGH TO LIMIT EMPLOYEES' EXPOSURE.
-AVOID CONTACT WITH THE EYES AND SKIN.
-DO NOT INGEST.
-DO NOT EAT, DRINK, OR SMOKE IN WORK AREAS OR WHERE MATERIAL IS STORED.
-MATERIAL IS NOT REGULATED UNDER SECTION 313 OF SARA III.
-MATERIAL MAY REQUIRE REPORTING UNDER SECTION 311/312 OF SARA III.
-MATERIAL IS REGISTERED UNDER TSCA INVENTORY.

MATERIAL SAFETY DATA SHEET

-DOT INFORMATION:

PROPER SHIPPING NAME:	TRICHLOROETHYLENE
HAZARD CLASS:	6.1
IDENTIFICATION NUMBER:	UN 1710
PACKING GROUP:	PG 111
REPORTABLE QUANTITY	45.4 Kg (100 LB.)
REQUIRED LABELS:	KEEP AWAY FROM FOOD (6.1)

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N/A = NOT APPLICABLE
N/E = NOT ESTABLISHED
ST = SHORT TERM EXPOSURE LIMIT
N/D = NOT DETERMINED
S = SUSPECTED

ATTACHMENT C-3

ANALYTICAL PARAMETERS FOR WASTE SCREENING & SCREENING FLOW CHART

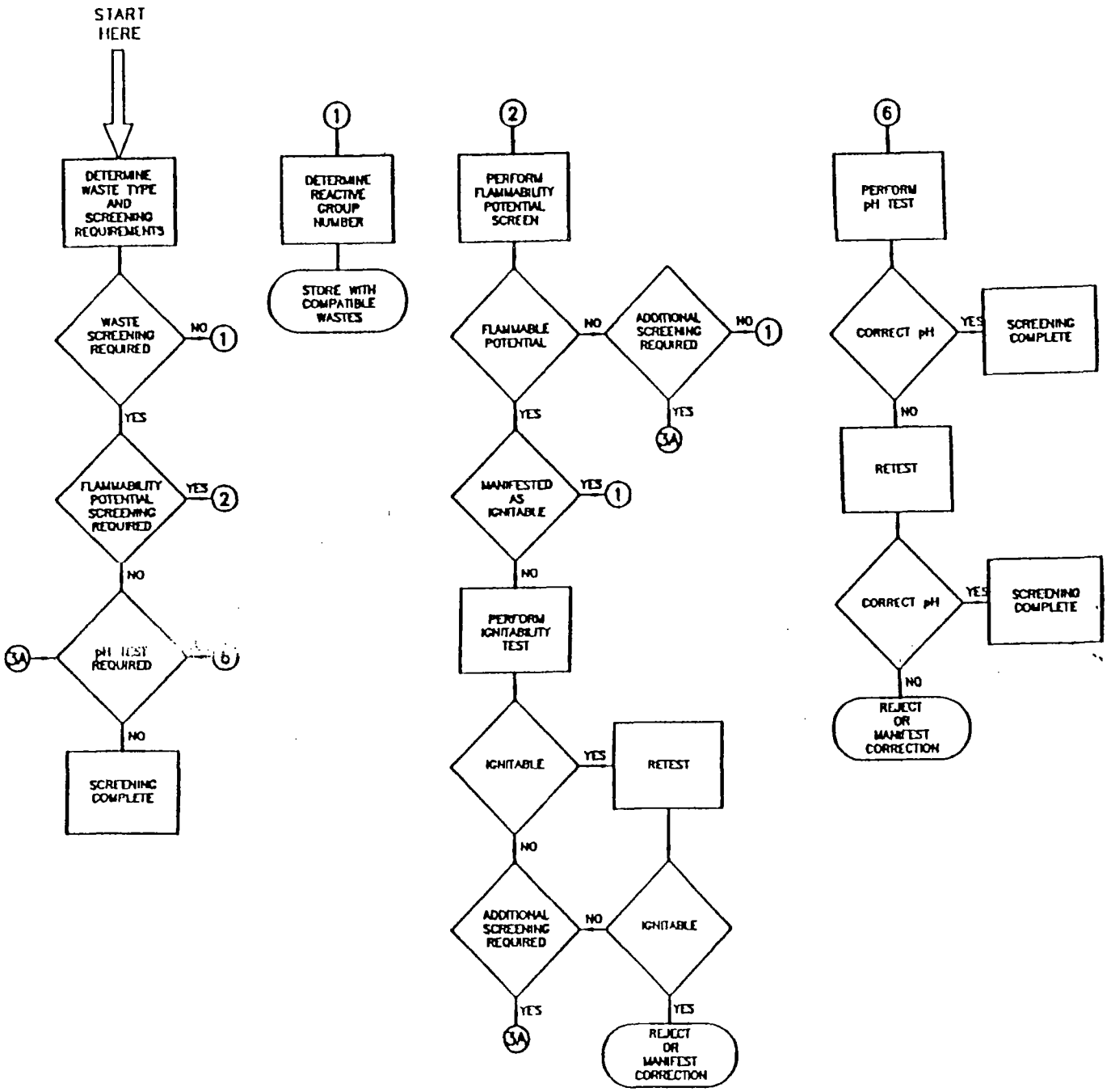
ATTACHMENT C-3

ANALYTICAL PARAMETERS FOR WASTE SCREENING

		Analtyical Parameter				
Type of Waste	*Color, Consistency, Physical State, Odor*	*Specific Gravity*	*Flammability*	*pH Testing*	*Paint Filter Test*	*Compatibility Test*
F001 & F002	•	•	•	as necessary	as necessary	as necessary
U080	•	•	•	as necessary	as necessary	as necessary
U121	•	•	•	as necessary	as necessary	as necessary
U210	•	•	•	as necessary	as necessary	as necessary
U226	•	•	•	as necessary	as necessary	as necessary
U228	•	•	•	as necessary	as necessary	as necessary
D004 through D011	@	@	@	@	as necessary	as necessary
D018	@	@	@	@	as necessary	as necessary
D019	@	@	@	@	as necessary	as necessary
D021	@	@	@	@	as necessary	as necessary
D022	@	@	@	@	as necessary	as necessary
D027	@	@	@	@	as necessary	as necessary
D028	@	@	@	@	as necessary	as necessary
D029	@	@	@	@	as necessary	as necessary
D030	@	@	@	@	as necessary	as necessary
D034	@	@	@	@	as necessary	as necessary
D035	@	@	@	@	as necessary	as necessary
D037	@	@	@	@	as necessary	as necessary
D038	@	@	@	@	as necessary	as necessary
D039	@	@	@	@	as necessary	as necessary
D040	@	@	@	@	as necessary	as necessary

@ D004 through D040 are underlying consitiuents of the primary waste codes and as such do not require additional testing in these categories.

WASTE SCREENING FLOW CHART
RCRA PART B PERMIT



LEGEND

(1) DECISION NODE IDENTIFICATION NUMBERS

ATTACHMENT C-4

QUALITY ASSURANCE PROJECT PLAN

QUALITY ASSURANCE PROJECT PLAN

Detrex Corporation Facility
Waste Analysis Plan
Melrose Park, Illinois

APRIL 2002

LIST OF ACRONYMS AND SHORT FORMS

ASTM	-	"Annual Book of ASTM Standards", American Society for Testing Materials, 1994
DQO	-	Data Quality Objective
Facility	-	Detrex Corporation Melrose Park, Illinois Facility
PE	-	Performance Evaluation
QA	-	Quality Assurance
QA/QC	-	Quality Assurance/Quality Control
QAO	-	Quality Assurance Officer
QAPP	-	Quality Assurance Project Plan
QC	-	Quality Control
SM	-	"Standard Methods for the Examination of Water and Wastewater", 19th Edition, 1995
SOPs	-	Standard Operating Procedures
SW-846	-	"Test Methods for Evaluating Solid Waste Physical/Chemical Methods", EPA SW-846, 3rd Edition, November 1986 with promulgated updates
USEPA	-	United States Environmental Protection Agency

TABLE OF CONTENTS

1.0 INTRODUCTION

This Quality Assurance Project Plan (QAPP) presents the organization, objectives, functional activities, and specific quality assurance (QA) and quality control (QC) activities associated with waste sampling and screening at the Detrex Corporation Facility (Facility), Melrose Park, Illinois. This QAPP also describes the specific protocols which will be followed for sampling, sample handling and storage, chain-of-custody, and screening analyses.

All QA/QC procedures will be in accordance with applicable professional technical standards, USEPA requirements, government regulations and guidelines, and specific project goals and requirements. This QAPP has been prepared by Detrex Corporation in accordance with the guidelines specified in Chapter One of "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", EPA SW-846, 3rd edition, November 1986 with promulgated updates (SW-846) and "Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans", USEPA, QAMS-005/80.

2.0 PROJECT DESCRIPTION

This QAPP has been developed for the evaluation of containerized wastes received at the Facility in Melrose Park, Illinois. The QAPP has been prepared to establish the QA/QC procedures necessary for the screening wastes for storage and processing at the facility.

2.1 DATA QUALITY OBJECTIVES

Data quality objectives (DQOs) are qualitative and quantitative statements which specify the quality of the data required to support decisions made during Site activities and are based on the end uses of the data to be collected.

The screening process is summarized in the Waste Analysis Plan (WAP) and consists of screening waste for the following parameters:

i) specific gravity;
ii) flammability;
iii) pH; and
iv) free liquids.

In addition, compatibility testing will be performed on wastes which will be combined and commingled prior to transportation to another Detrex Corporation Facility or another TSDF.

Since the screening analyses are intended to confirm waste characteristics or determine the acceptability of the waste relative to the Facility's permit, and are

supplemental to information provided by the generator, the QA/QC procedures performed are minimal. The laboratory QA/QC procedures include verifying the tests will elicit a positive result using standard materials, where applicable, to ensure that false negative results do not occur and verifying that false positive results do not occur by testing blank materials (i.e. distilled water).

2.2 PROJECT OBJECTIVES

The objectives of the waste sampling and screening are to determine whether the wastes or products received at the facility are:

i) consistent with the generator's information and/or generator's waste material profile sheet;
ii) acceptable within the scope of the facility's RCRA Part B Permit;
iii) acceptable within the scope of the facility's waste treatment/storage capabilities; and
iv) compatible with each other for storage or combining and commingling.

3.0 PROJECT ORGANIZATION AND RESPONSIBILITY

The Detrex Facility Manager has overall responsibility for the wastes accepted at the Facility. All waste sampling, flammability screening, specific gravity, pH, and any other testing performed at the facility will be overseen by the Facility Manager.

A Detrex Corporation laboratory or a Detrex-approved subcontract laboratory will perform the remaining screening tests and compatibility testing. The organization and responsibility of the laboratories will be consistent with each laboratory's QA Plan.

4.0 QUALITY ASSURANCE OBJECTIVES FOR MEASUREMENT DATA

The overall QA objective is to develop and implement procedures for waste sampling, chain-of-custody, screening analyses, and reporting that will provide data of sufficient quality to determine if wastes are acceptable within the scope of the permit, and whether wastes can be effectively combined and commingled. Specific procedures for sampling, chain-of-custody, laboratory instrument calibration, laboratory analysis, reporting of data, internal quality control, audits, preventive maintenance of laboratory equipment, and corrective action are described in other sections of this QAPP. The purpose of this section is to address the specific objectives for accuracy, precision, completeness, representativeness, and comparability.

4.1 LEVEL OF QC EFFORT

The level of QC effort will consist of testing blank and standard materials, where appropriate, to determine the presence of false positive and false negative results, respectively.

4.2 ACCURACY, PRECISION AND SENSITIVITY OF ANALYSES

The fundamental QA objective with respect to accuracy and precision of the screening data is to achieve the QC acceptance criteria of the analytical protocols referenced in Section 8.0.

4.3 COMPLETENESS, REPRESENTATIVENESS AND COMPARABILITY

Completeness is a measure of the amount of valid data obtained from a measurement system compared to the amount that was expected to be obtained under normal conditions. It is expected that the analytical analysis will provide data meeting QC acceptance criteria for 80 percent or more for all samples tested using the referenced methods.

Representativeness expresses the degree to which data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, a process condition or an environmental condition. Representativeness is a qualitative parameter which is dependent upon the proper design of the sampling program and proper laboratory protocol. Representativeness will be satisfied by insuring that proper sampling techniques are used and proper testing procedures are followed.

Comparability expresses the confidence with which one data set can be compared with another. The extent to which existing and planned testing data will be comparable depends on the similarity of sampling and analytical methods. The procedures used to obtain the planned analytical data, as documented in the QAPP, are expected to provide comparable data. These new analytical data, however, may not be directly comparable to existing data because of difference in procedures and QA objectives.

5.0 SAMPLING PROCEDURES

The following subsections presents the procedures for sampling wastes and products transported to the facility.

5.1 WASTE SAMPLING

5.1.1 Sample Labeling

Each sample will be labeled with a unique sample number that will facilitate tracking and cross-referencing of sample information. The sample numbering system to be used will consist of identifying the generator and assigning a sequential number for each drum or container.

5.1.2 Sample Containers and Handling

All samples will be placed in a sample container (i.e., four-ounce), labeled, and properly sealed. The sample labels will include the information specified in Section 5.1.1. Samples sent off site for testing will be cushioned within shipping containers by the use of vermiculite, foam chips and/or bubble wrap and shipped according to applicable DOT standards.

Upon receipt of the shipping container at the laboratory, the shipping container will be inspected by the laboratory's sample custodian. The condition of the shipping container will be noted by the sample custodian. The sample custodian at the laboratory will check the contents of the shipping container with those samples listed on the packing list. Any damage to the samples or discrepancies in the accompanying documentation will be recorded by the laboratory. Any damage or discrepancies will be reported to Detrex.

In most cases the analytical testing that is to be performed on samples obtained from containers of Hazardous Waste can be accomplished in house.

5.2 SAMPLING PROTOCOLS

5.2.1 Safety Considerations

1. Proper ventilation is provided for the sampling operation.
2. Personnel will wear appropriate Personal Protective Equipment (PPE), which may include: safety boots, protective apron, gloves, and goggles or face shield during sampling.
3. Any built-up pressure within a container is slowly released by gently cracking the bung.

5.2.2 Sampling Equipment

Materials and equipment required for sampling are as follows:

1. A container/bottle of appropriate size and construction to propertly hold the waste.
2. Sample label.
3. Four-foot by 3/8-inch ID sampling thief.
4. Bung wrench
5. Packing slip (for off-site analyses).
6. Four-foot sampling auger (trier) for solid samples.

5.2.3 Container Sampling

5.2.3.1 Discrete Liquid Concentrated Waste Samples

The following procedure shall be adhered to during the sampling of individual containers.

1. Remove bung using the bung wrench.
2. Slowly insert thief to the bottom of the container or until a solid layer is encountered.
3. Allow the waste in the container to reach its natural level in the thief.
4. Cap the top of the thief with gloved thumb.
5. Carefully remove the thief from the container and insert the uncapped end in a beaker.
6. Gently pour appropriate sample volume into sample jar.
7. Up to 10 discrete samples may be combined to produce a composite sample of the containerized liquid wastes. Mix composite sample and transfer to sample container.
8. Label sample.

5.2.3.2 Discrete Solid Waste Samples

The following procedures shall be adhered to during the sampling of individual containers.

1. Remove bung or container lid, as applicable
2. Advance sample auger through entire container.
3. Carefully remove sampler.
4. Place composite solid waste sample into sample jar.
5. Up to 10 discrete samples may be combined to produce a composite sample of the solid wastes. Mix composite sample and transfer to sample container.
6. Label sample.

5.2.4 Bulk Shipment Sampling

Not applicable to this facility.

5.2.5 Limitations

1. Extremely hard solid wastes may require alternate sampling method.
2. Viscous liquids may adhere to exterior of sample thief.

6.0 SAMPLE CUSTODY AND DOCUMENT CONTROL

6.1 FACILITY CHAIN-OF-CUSTODY PROCEDURES

The sample packaging and shipment procedures summarized below will insure that samples shipped off site will arrive at the laboratory with the chain-of-custody intact. The protocol for specific sample numbering and other sample designations are included in Section 5.0.

The following chain-of-custody procedures will be used by the facility:

1. The sampler is personally responsible for the care and custody of the samples until they are transferred. As few people as possible should handle the samples.
2. All containers/bottles will be labeled with unique sample numbers.
3. Sample labels will be completed for each sample using waterproof ink.

6.1.2 Transfer of Custody and Shipment Procedures

The following custody and shipping procedures will be followed:

1. Samples are accompanied by a properly completed packing list or chain-of-custody form. The sample numbers will be listed on the packing list or chain-of-custody form.
2. Samples will be properly packaged for shipment and dispatched to the appropriate laboratory for analysis with a separate signed packing list or custody form enclosed in each sample box. Shipping containers will be appropriately secured for shipment to the laboratory.
3. Whenever samples are split with another party or government agency, a separate packing list or chain-of-custody record is prepared for those samples and marked to indicate with whom the samples are being split. The person relinquishing the samples to the other party should request the representative's signature acknowledging sample receipt.

4. All shipments will be accompanied by the packing list or chain-of-custody record identifying the contents. The original will accompany the shipment and copies will be retained by the Facility.
5. If the samples are sent by common carrier, a bill of lading will be used and will be packaged according to applicable DOT requirements. Receipts of bills of lading will be retained as part of the permanent documentation.

6.2 LABORATORY CHAIN-OF-CUSTODY PROCEDURES

The sample custodian at the laboratory will assign a unique number to each incoming sample for use in the laboratory. The unique number and customer number will then be entered into the sample receiving log. The laboratory date of receipt will also be noted.

Laboratory custody procedures and document control for those samples analyzed by the laboratory will be consistent with their standard laboratory protocols.

6.3 STORAGE OF SAMPLES

After the sample custodian has prepared the sample receiving log, the samples will be stored in the appropriate locations. All samples will be stored within an access controlled location and will be maintained under the proper preservation requirements until completion of all analytical work or, as a minimum, for 30 days after receipt of the final report by Detrex.

6.4 FINAL EVIDENCE FILES CUSTODY PROCEDURES

The laboratory will be responsible for maintaining and storing analytical log books and laboratory data. Raw laboratory data files will be inventoried and maintained by the laboratory for a period of five years unless the need for longer storage is required by Detrex.

7.0 CALIBRATION PROCEDURES AND FREQUENCY

This section describes procedures for maintaining the accuracy for all the instruments and measuring equipment which are used for conducting testing. These instruments and equipment should be calibrated prior to each use or on a scheduled periodic basis.

7.1 LABORATORY INSTRUMENTS

Calibration of laboratory equipment will be based on standard operating procedures (SOPs) approved by the laboratory. Records of calibration, repairs, or replacement will be filed and maintained by the designated laboratory personnel performing QA/QC activities. These records will be filed at the location where the work is performed and will be subject to QA audit. For all instruments, the laboratory will maintain a properly trained repair staff with in-house spare parts or will maintain service contracts with vendors.

The records of calibration will be kept as follows:

1. If possible, each instrument will have record of calibration permanently affixed with an assigned record number.
2. A label will be affixed to each instrument showing description, manufacturer, model numbers, date of last calibration and by whom calibrated (signature), due date of next calibration and compensation or correction figures, as appropriate.
3. A written stepwise calibration procedure will be available for each piece of test and measurement equipment.
4. Any instrument that is not calibrated to within the manufacturer's original specification will display an appropriate warning tag.

Specific calibration procedures are detailed in the respective methods.

8.0 ANALYTICAL PROCEDURES

The samples collected for laboratory testing will be analyzed using the methods detailed in the table shown below.

MATRIX	PARAMETER	METHODS OF ANALYSIS
Waste Liquids & Solids	Specific Gravity	Detrex Test Method
Waste Liquids & Solids	Flammability	ASTM D4982-89
Waste Liquids & Solids	pH	ASTM D4980-89
Waste Liquids & Solids	Paint Filter Test	SW-846-9095
Waste Liquids & Solids	Ignitability	ASTM D3278

NOTES:
ASTM – "Annual Book of ASTM Standards" American Society for Testing and Materials 1994

SW-846 – "Test Method for Evaluating Solid Wastes, Physical/Chemical Methods", SW-846, 3rd edition, November 1986

9.0 INTERNAL QUALITY CONTROL CHECKS AND FREQUENCY

The internal QC checks for the methods of analyses will be consistent with the procedures specified in the Table in 8.0

10.0 DATA REDUCTION, VALIDATION AND REPORTING

The laboratory will perform analytical data reduction (i.e. calculations, interpretation) and review in-house under the direction of the laboratory QA Officer. Specific data reduction procedures will be consistent with the laboratory's standard procedures. Data reduction, review and reporting by the laboratory will be conducted following the laboratory's QA Plan.

Laboratory data packages (i.e. analytical reports) will consist of the following deliverables:

i) a case narrative that includes a summary of analytical methods used;
ii) dates of sample receipt and analysis;
iii) laboratory and Facility sample identification numbers;
iv) samples results of all analyses in a tabular format;
v) a QC summary section; and
vi) copies of packing lists or executed chain-of-custody forms.

11.0 PERFORMANCE AND SYSTEM AUDITS

Performance and system audits of both Facility and laboratory activities may be conducted to verify that sampling and analysis are performed in accordance with the procedures established in the QAPP. The audits of Facility and laboratory activities include two separate independent parts; internal and external audits.

11.1 SAMPLING PROCEDURE AUDITS

Internal audits of sampling activities may be conducted by the Facility Manager. The audits will include examination of sampling records, sample collection, handling and packaging in compliance with the established procedures. These audits when conducted will be used to correct deficiencies, and to verify that QA procedures are maintained. The audits will involve review of sample documentation procedures.

Any external audits will be conducted by ILEPA or USEPA.

11.2 LABORATORY AUDITS

The internal performance and system audits of the laboratory will be conducted by the laboratory's QA Officer. The system audits will include examination of laboratory sample receiving documentation, sample log-in, sample storage, chain-of-custody procedure, sample preparation and analysis, instrument operating records, etc. The QA officer will evaluate the analytical results of these performance evaluation samples to ensure the laboratory maintains acceptable performance.

Any external audits of the laboratories will be conducted by ILEPA or USEPA.

12.0 PREVENTIVE MAINTENANCE

All analytical instruments to be used in this project will be serviced by the laboratory personnel at regularly scheduled intervals in accordance with the manufacturers recommendations. Instruments may also be serviced at other times due to failure. Requisite servicing beyond the abilities of the laboratory personnel will be performed by the equipment manufacturer or a qualified representative.

Daily checks of each instrument will be by the analyst who has been assigned responsibility for that instrument. Manufacturer's recommended procedures will be followed in every case. All maintenance will be recorded in a bound logbook.

13.0 SPECIFIC ROUTINE PROCEDURES USED TO ASSESS DATA PRECISION, ACCURACY AND COMPLETENESS

The following procedures and formulae are utilized to assess the levels of precision, accuracy and completeness achieved during the associated sample analyses.

13.1 LABORATORY DATA

Laboratory results will be assessed for compliance with required precision, accuracy and completeness as follows:

1. Precision of laboratory analysis will be assessed for compliance with the established QC criteria that are described in the referenced methods.
2. Accuracy of laboratory results will be assessed for compliance with the established QC criteria that are described in the referenced methods.
3. Completeness will be assessed by comparing the number of valid results to the total possible number of results. The required level of completeness for laboratory analyses will be 80 percent.

14.0 CORRECTIVE ACTION

The need for corrective action may be identified by system or performance audits or by standard QC procedures. The essential steps in the corrective action system will be:

i) checking the predetermined limits for data acceptability beyond which corrective action is required;
ii) identifying and defining problems;
iii) assigning responsibility for investigating the problem;
iv) investigating and determining the cause of the problem;
v) determination of a corrective action to eliminate the problem (this may include reanalyses or resampling and analyses);
vi) assigning and accepting responsibility for implementing the corrective action;
vii) implementing the corrective action and evaluating the effectiveness;
viii) verifying that the corrective action has eliminated the problem; and
ix) documenting the corrective action taken.

For each measurement system, the Laboratory's QA Officer or the analyst will be responsible for initiating the corrective action and the laboratory supervisor will be responsible for implementing the corrective action. The corrective action taken will be consistent with the laboratory's standard procedures.

15.0 QUALITY ASSURANCE REPORT TO MANAGEMENT

Management will receive reports on data quality with each analytical report in the form of QC summaries appended to the laboratory reports. The laboratory's QA Officer will be responsible within that organizational structure for preparing these reports. the Facility Manager will be responsible for maintaining any analytical reports received from the laboratory.

DETERMINATION OF SOLVENT CONTENT IN SPENT SOLVENTS FROM DEGREASING OPERATIONS USING SPECIFIC GRAVITY METHOD

DETERMINATION OF SOLVENT CONTENT IN SPENT SOLVENTS FROM DEGREASING OPERATIONS USING SPECIFIC GRAVITY METHOD

PROCEDURE

Collect sample using the Sample Thief.

1. Transfer sample to a container of sufficient size to allow for mixing.

2. Shake container for at least 30 seconds.

3. Place the thermometer and a hydrometer in the hydrometer jar.

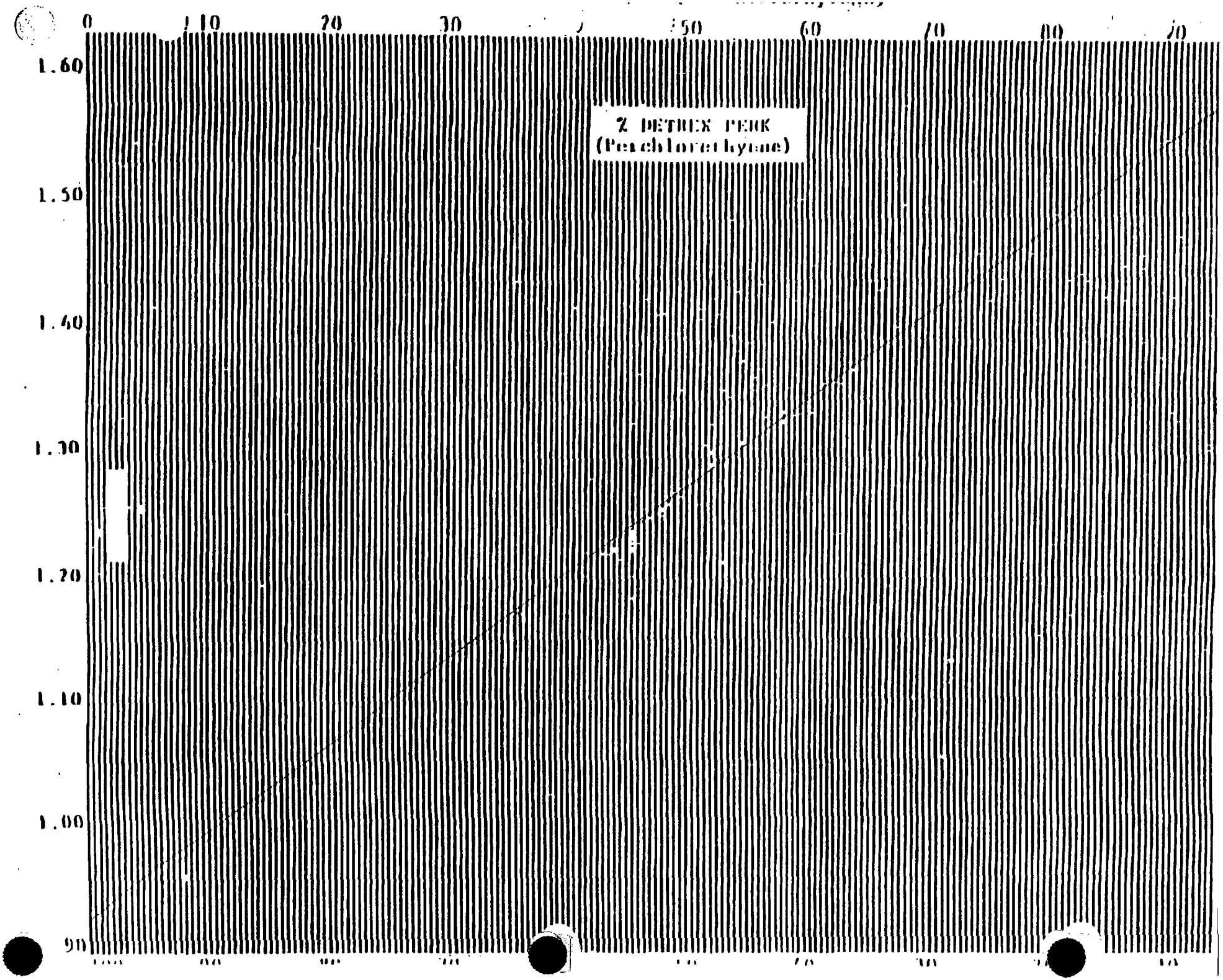
4. Fill the hydrometer jar to within one inch of the top with the mixture to be tested.

5. If the hydrometer reads off-scale, replace it with a higher or lower range hydrometer as required.

6. Read the hydrometer to the nearest 0.01 SpG Unit.

7. Using the attached Solvent-Oil Mixture vs. Gravity Graph or Chart, for the appropriate solvent type, determine the weight percent oil.

8. The solvent concentration is read directly from the graph.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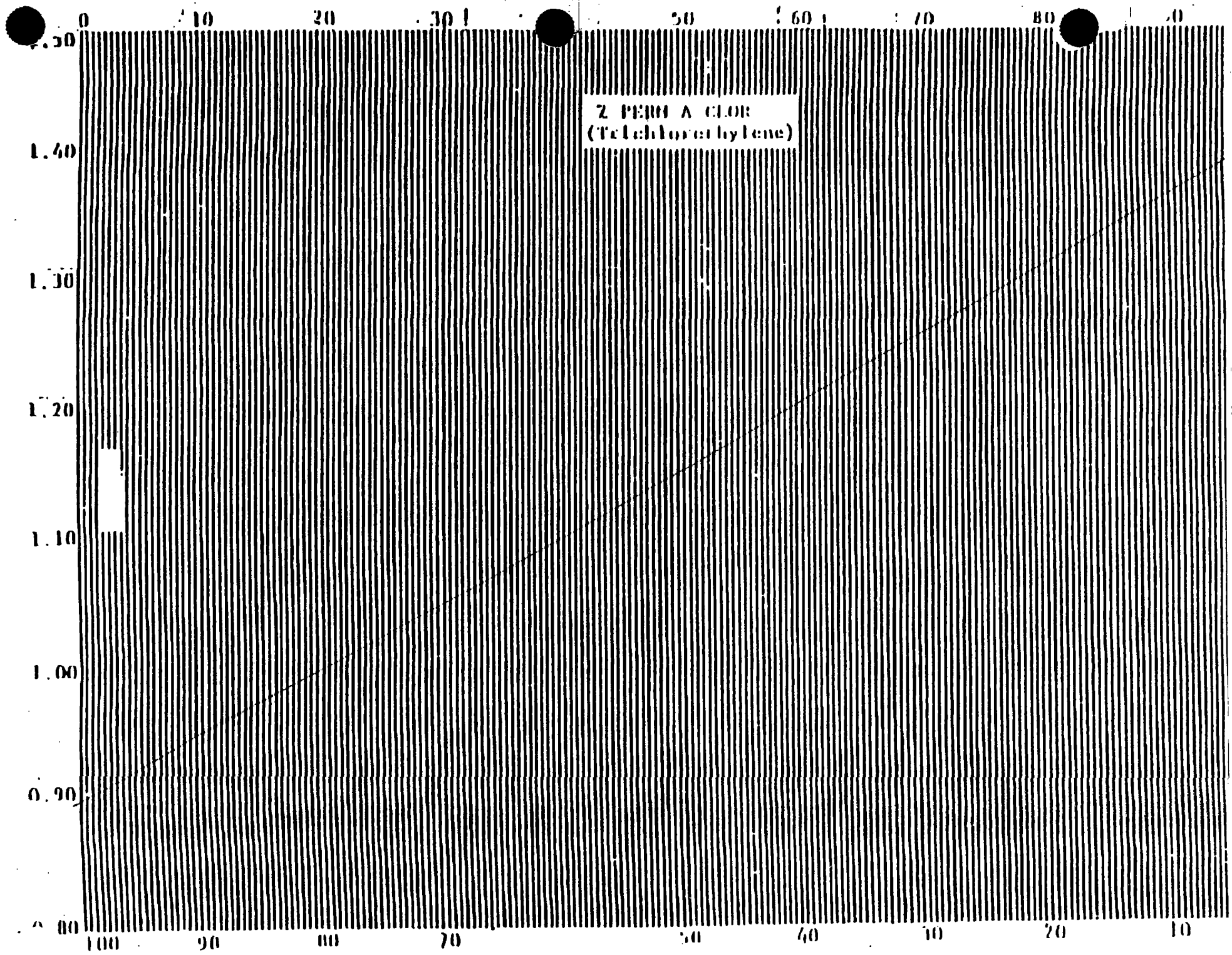
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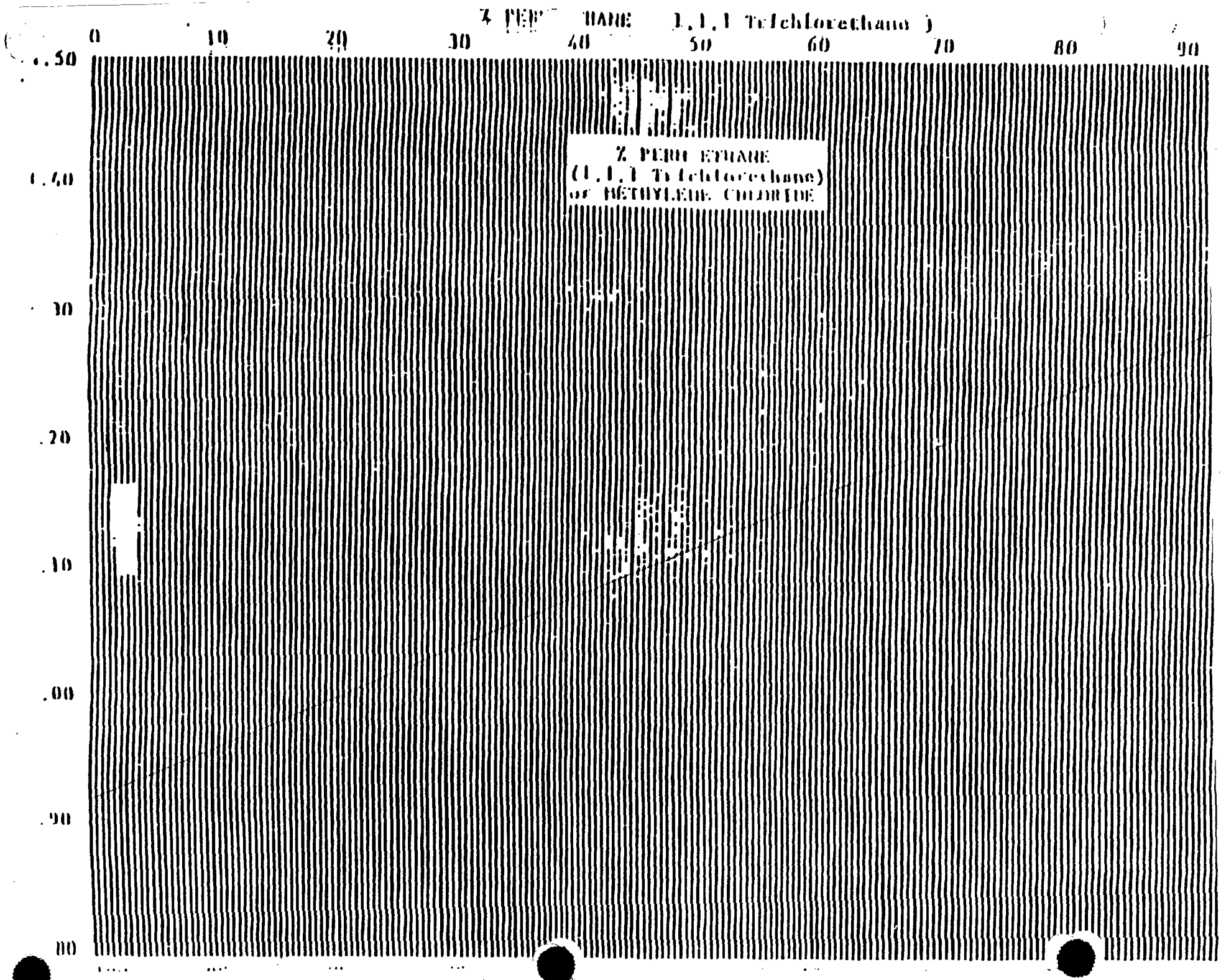
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Designation: D 4982 – 89

Standard Test Methods for Flammability Potential Screening Analysis of Waste[1]

This standard is issued under the fixed designation D 4982; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 These test methods are used to indicate the fire-producing potential of wastes. The following test methods can be applied to waste liquids, sludges, semisolids, or solids:

	Sections
Test Method A—Test Sample Exposed to Heat and Flame	11 to 13
Test Method B—Test Sample Exposed to Spark Source	14 to 15

1.2 These test methods should be used to measure and describe the properties of materials, in response to heat and flame under controlled laboratory conditions and should not be used to describe or appraise the fire hazard or fire risk of materials under actual fire conditions. However, results of these tests may be used as elements of a fire risk assessment that takes into account all of the factors that are pertinent to an assessment of the fire hazard of a particular end use.

1.3 These test methods are designed and intended as preliminary tests to complement the more sophisticated quantitative analytical techniques that may be used to determine flammability. These test methods offer, to the user, option and the ability to screen waste for potentially hazardous flammability potential when the more sophisticated techniques are not available and the total waste composition is unknown.

1.4 *This standard may involve hazardous materials, operations, and equipment. This standard does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.* Specific hazard information is given in Section 6 and 13.4.3.1.

2. Referenced Documents

2.1 *ASTM Standard:*

D93 Test Methods for Flash Point by Pensky-Martens Closed Tester[2]

2.2 *Other Standard:*

Prudent Practices for Handling Hazardous Chemicals in Laboratories[3]

3. Terminology

3.1 *Description of Term Specific to This Standard:*

3.1.1 *screening analysis*—a *preliminary* qualitative or semiquantitative test developed from classical qualitative and quantitative techniques that is designed to efficiently give the user specific information about a waste that will aid in determining waste identification, process compatibility, and safety in handling.

4. Summary of Test Methods

4.1 *Method A*—A test sample is exposed to heat and flame. The sample is reported as having a positive or negative flammability potential as described in the test procedure.

4.2 *Method B*—Sparks from a flint lighter are introduced to the vapor space immediately above a representative sample of a waste, and observation is made for a flash in the vapor space or ignition of the sample. A flash in the vapor space or ignition and burning of the waste indicates a positive flammability potential at ambient temperature.

5. Significance and Use

5.1 These test methods are intended for use by those in the waste management industries to aid in identifying the flammability potential or waste materials.

6. Hazards

6.1 Avoid inhalation and skin or eye contact, or both, of any hazardous materials.

6.2 Standard laboratory hygiene practices should be followed when conducting these tests.

6.3 All tests must be performed in a laboratory hood equipped with an exhaust intake along the front edge of the work area to collect any heavier-than-air vapors generated.

6.4 The analyst must wear flame resistant oven gloves.

6.5 Waste containing or suspected of containing highly volatile organics or peroxides should be tested using a much smaller sample than that used in 13.2.

7. Sampling

7.1 Sample containers must be kept tightly sealed until tested.

7.2 Samples should be analyzed as soon as possible after collection.

7.3 If necessary, allow the sample to come to room temperature in a tightly sealed container. For example, frozen material should be allowed to thaw completely.

8. Report

8.1 Report the following information:

8.1.1 Sample identification,

8.1.2 Date of test,

8.1.3 Sample classification: positive or negative, and

8.1.4 Reference to the procedure applied.

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[1] These test methods are under the jurisdiction of ASTM Committee D-34 on Waste Management and is the direct responsibility of Subcommittee D34.02 on Chemical Characterization.

Current edition approved Nov. 10, 1989. Published December 1989.

[2] Annual Book of *ASTM Standards*, Vol 05.01.

[3] National Research Council, National Academy Press, Washington, DC, 1981.

9. Quality Control

9.1 Quality control check samples and duplications should be performed at an action level specified by the laboratory and at an appropriate frequency.

9.2 Flammability standards should be maintained for analyst training and as reference guides. Examples are given in the following table.

Flammability Potential Screening Analysis

Methyl alcohol (methanol)	Difficult-to-see flame: flammable at or below room temperature.
Glacial acetic acid	Flammable at temperatures above normal room temperature.
Hendecane (n-undecane)	Flammable at temperatures higher than glacial acetic acid.
Kerosene (Fuel Oil No. 1)	Flammable over a range of temperatures higher than normal room temperature.
p-Xylene	Flammable at or above room temperature; freezes at 13°C. A spiked soil sample frozen at 0°C demonstrates interference.
Chlorofluorocarbon 113 (1,1,2-trichloro-1,2,2-trifluoroethane)	Warning: phosgene formation likely; see 13.4.3.1.

10. Precision and Bias

10.1 No statement is made about either the precision or bias of these test methods since the result merely states whether there is conformance to the criteria for success specified in the procedure.

TEST METHOD A—EXPOSURE TO HEAT AND FLAME

11. Interferences

11.1 Drafts in the laboratory fume hood where the test is performed could cause excessive cooling and false negative results. A properly operating fume hood with a face velocity of 150 ft/min should provide consistent, usable results.

11.2 Ignition sources that provide excessive heating rates alone or combined with a very small test portion may obscure results. That is, the sample may be decomposed, sintered, fused, evaporated, or otherwise consumed before positive or negative evidence of flammability is observed. The use of sufficiently large test portions and of heating rates typical of a bunsen burner should resolve this problem.

11.3 An inadequate source of heating could limit the volatilization of flammable components and provide false negative results.

11.4 Difficult-to-observe flames resulting from the burning of certain compounds (for example, methanol) could provide false negative results. If the presence of these compounds is suspected, the presence of flammability might be confirmed by the insertion of a watchglass just above the test material. The watchglass is then examined for products of combustion (for example, moisture and soot).

NOTE 1—The watchglass method cannot distinguish between vaporized water or water produced by combustion.

11.5 An improperly adjusted gas burner (for example, with an insufficiently aerated flame) could introduce raw gas into or immediately above the sample. This raw gas could briefly support a flame after the source of ignition is removed, providing the appearance of a flammable sample and a false positive result.

12. Apparatus

12.1 *Gas Burner*, (for example, a bunsen burner) with adjustable air shutter and an adjustable gas orifice is r The gas burner and fuel supply line must be approp the gas supplied: natural gas, artificial gas (including p and butane), or liquified petroleum gas (LP gas or Where a gas supply line cannot be provided, a propan may be substituted.

12.2 *Lighter*, (for example, piezo lighter) for bu required.

12.3 *Aluminum Weighing Boats* or other non-flan containers are needed.

12.3.1 **Caution**—Weighing boats of material othe aluminum should be used if the testing materials rea aluminum, for example, caustics.

12.4 *Watchglass.*

12.5 *Large Beaker, Tongs, Asbestos-Free High-T ature Gloves or Mittens*, or other apparatus as nee extinguish burning materials.

13. Procedure

13.1 Light a gas burner and adjust to a typicall flame that is not readily blown out. A yellow flame affected by drafts indicates insufficient air (the air:fuel too low). A sharp, blue flame is good. (If the flam above the burner head, is very difficult to light, or te extinguish itself, indicates that too much air or and fuel are being supplied to the burner.)

13.2 Place a sufficient amount (approximately 5 test sample in an aluminum weighing boat or other no mable container.

13.3 Using a gas burner, hold the flame imme above the test sample for 2 to 3 s without touching the flame to the sample.

13.3.1 If ignition (a flash or burning) is observed bef after the source of ignition (the flame of the burn removed, the sample is said to have a positive flamm potential. A positive result may require further investi (see 13.4.1).

13.3.2 The confirmation of flammability may requi use of a watchglass (see 11.4).

13.3.3 If there is no ignition, proceed to 13.4.

13.4 Using a gas burner, briefly (for at least 15 s) app flame to the sample in an attempt to ignite the sampl

13.4.1 If the sample ignites, the sample is said to h positive flammability potential.

13.4.1.1 When more accurate waste characterizat necessary, liquid samples may be quantified using a c cup flash point tester.

13.4.1.2 Solids with a positive flammability pot should be further investigated.

13.4.2 If the sample decomposes, boils (if a liqui otherwise fails to ignite after at least 15 s of conti sample heating by the burner flame, the flamma potential is reported as negative.

13.4.3 Halogenated solvents typically give off vab pors that may result in a false positive flammability p tial.

NOTE 2: **Warning**—Phosgene, an extremely toxic gas, is a co tion product of halogenated compounds burned in air.

13.5 Shut off the gas burner when not in use. Extinguish

ıple by setting an aluminum weighing boat or .tchglass atop the one containing the burning sample, (or vert a spoutless beaker over the sample container and all). se of tongs or high temperature gloves or mittens may be cessary to handle the equipment.

TEST METHOD B—EXPOSURE TO SPARK SOURCE

14. Apparatus

14.1 *Oven Gloves.*

14.2 *Flint Lighter*, the type typically used to light an r/acetylene torch is required.

14.3 *Disposable 250-mL Beaker*, of plastic is required.

14.4 *Watchglass*, 100 mm.

14.5 *Metal Vessel* (with lid), of adequate depth and ımeter to contain beaker and watchglass is needed.

14.6 *Thermometer.*

15. Procedure

15.1 Place approximately 100 mL of the representative sample of the material to be tested into the plastic beaker (see 7.3).

15.2 Place the plastic beaker in the steel vessel, cover the beaker with the watchglass, and allow to stand at ambient conditions for 5 min.

15.3 Record the ambient temperature.

15.4 Remove the watchglass, place the igniter immediately above the waste and strike it several times to produce sparks.

15.5 If the material does catch fire and burn, extinguish the flames by immediately placing the lid on the steel vessel, thus smothering the fire and report as positive flammability potential.

Designation: D 4980 – 89

Standard Test Methods for Screening of pH in Waste[1]

This standard is issued under the fixed designation D 4980; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 These test methods are used to determine the pH of a hazardous waste liquid, sludge, semisolid and solid.

	Sections
Test Method A—pH Screening by pH Paper	9 to 14
Test Method B—pH Screening by Electrometric Measurement	15 to 22

1.2 Test Method A uses a wide-range pH paper for a rapid indication of pH to within about 1 pH unit.

1.3 Test Method B uses a pH meter to measure within about 0.1 pH unit.

1.4 These test methods are designed and intended as a preliminary test to complement the more sophisticated quantitative analytical techniques that may be used to determine pH. These test methods offer, to the user, the option and the ability to screen waste for potentially hazardous levels of acidity and alkalinity when the more sophisticated techniques are not available and the total waste composition is unknown.

1.5 *This standard may involve hazardous materials, operations, and equipment. This standard does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.* Specific hazard information is given in Section 6.

2. Referenced Documents

2.1 *ASTM Standards:*
D 1193 Specification for Reagent Water[2]
D 1293 Test Methods for pH of Water[2]

3. Terminology

3.1 *Description of Term Specific to This Standard:*

3.1.1 *screening analysis*—a preliminary qualitative or semi quantitative test developed from classical qualitative and quantitative techniques that is designed to efficiently give the user specific information about a waste that will aid in determining waste identification, process compatibility and safety in handling.

4. Significance and Use

4.1 These test methods are intended for use by those in the waste management industries to characterize waste streams by pH. These methods will identify those materials that may dictate a specific waste manag procedure due to high acidity or alkalinity.

5. Reagents

5.1 *Purity of Reagents*—Reagent grade chemicals s used in all tests. Unless otherwise indicated, it is in that all reagents conform to the specifications of the mittee on Analytical Reagents of the American Ch Society where such specifications are available.[3] Other may be used, provided it is first ascertained that the r is of sufficiently high purity to permit its use w lessening the accuracy of the determination.

5.2 *Purity of Water*—Unless otherwise indicated, ences to water shall be understood to mean reagent w defined by Type III of ASTM Specification D 1193.

6. Hazards

6.1 Avoid inhalation and skin and eye co[illegible]ct hazardous materials.

6.2 All measurements shall be done in a labor[illegible]ory hood.

7. Sampling

7.1 Collect a representative sample of the waste.

7.2 Samples should be analyzed as soon as possible collection.

8. Report

8.1 The report shall include at a minimum:
8.1.1 Sample identification,
8.1.2 Date of test,
8.1.3 Reference to the procedure applied, that is method and if applicable, dilution ratio,
8.1.4 Analytical results, and
8.1.5 Identification of the analyst.

TEST METHOD A—pH SCREENING BY pH PAPEI

9. Summary of Test Method A

9.1 *pH Paper*—A small portion of the sample is i duced onto full range pH paper. The results are vis compared to the appropriate color chart and reported t pH unit.

[1] These test methods are under the jurisdiction of ASTM Committee D-34 on Waste Management and is the direct responsibility of Subcommittee D34.02 on Physical and Chemical Characterization.
Current edition approved Nov. 10, 1989. Published December 1989.
[2] *Annual Book of ASTM Standards*, Vol 11.01.

[3] "Reagent Chemicals, American Chemical Society Speci[illegible]s," Chemical Soc., Washington, DC. For suggestions on the testing of reager listed by the American Chemical Society, see "Reagent Chemicals and Stanc by Joseph Rosin, D. Van Nostrand Co., Inc., New York, NY, and the "[illegible] States Pharmacopeia."

10. Interferences

10.1 Materials that mask the pH paper, for example, oils, ns paint, etc. cause the visual detection of color on the paper e difficult.

10.2 Strong dyes and solutions of deep colors can give false results.

10.3 Oxidizers can bleach the pH paper.

11. Apparatus

11.1 *Stirring Rod, Spatula, and Disposable Pipet or Eye Dropper*, for transferring sample to test paper.

11.2 *Disposable Beaker, Test Tube*, etc.

11.3 *Vortex Mixer* (optional).

11.4 *Separatory Funnel.*

12. Reagents and Materials

12.1 Full range pH paper with a stated precision of 1 pH unit and with a corresponding color chart.

12.2 Standard Buffer Solutions.

13. Procedure

13.1 *Aqueous Liquids*—Introduce a representative portion of the sample onto a strip of pH paper.

13.2 *Solids, Sludges, and Non-Aqueous Liquids:*

13.2.1 Place approximately 10 mL of water in a disposable beaker or test tube.

13.2.2 Add approximately 1 mL of waste sample and agitate for 10 s or until well mixed.

13.2.3 Let suspension settle and measure the pH of the ernatant as described in 13.1.

13.3 Visually compare the pH paper to the color chart and d the pH to the nearest whole unit. See 8.1.4.

14. Quality Control

14.1 Standard buffer solutions are used to check each new lot or shipment of pH paper.

15. Precision and Bias

15.1 Precision and Bias statements shall be supplied at a later date.

METHOD B—pH SCREENING BY ELECTROMETRIC MEASUREMENT

16. Summary of Test Method B

16.1 *pH Meter*—The pH of a sample is determined electrometrically using a pH meter with a combination pH electrode. Prior to the analysis of a sample, the instrument must be calibrated by using at least two standard buffer solutions. The results should be reported to the nearest 0.1 pH unit.

17. Interferences

17.1 The glass electrode, in general, is not subject to solution interferences from color, turbidity, colloidal matter, oxidants, reductants, or high salinity.

17.2 Sodium error at pH levels >10 can be reduced or minimated by using a low sodium error electrode.

17.3 Coatings of oily material or particulate matter can impair electrode response. These coatings can usually be removed by gentle wiping or detergent washing, followed by dilute water rinsing. An additional treatment with hydrochloric acid 1+9, (1 volume HCl added to 9 volumes of H_2O) may be necessary to remove any remaining film.

17.4 Temperature effects on the electrometric determination of pH arise from two sources. The first is caused by the change in electrode output at various temperatures. This interference can be controlled with instruments having temperature compensation or by calibrating the electrode instrument system at the temperature of the samples. The second source of temperature effects is the change of pH due to changes in the sample as the temperature changes. This error is sample dependent and cannot be controlled. It should, therefore, be noted by reporting both the pH and temperature at the time of analysis.

18. Apparatus

18.1 *pH Meter, Laboratory of Field Model*—A wide variety of instruments are commercially available with various specifications and optional equipment.

18.2 *Glass Electrode.*

18.3 *Reference Electrode*—A silver-silver chloride or other reference electrode of constant potential may be used.

NOTE 1—Combination electrodes incorporating both measuring and reference functions are convenient to use and are available with solid, gel type filling materials that require minimal maintenance.

18.4 *Magnetic Stirrer and TFE-Fluorocarbon-Coated Stirring Bar.*

18.5 *Thermometer or Temperature Sensor*, for automatic compensation.

19. Reagents and Materials

19.1 *Primary Standard Buffer Salts*, are available from NIST and should be used in situations where extreme accuracy is necessary. Preparation of reference solutions from these salts requires some special precautions and handling such as low conductivity dilution water, drying ovens, and carbon-dioxide-free purge gas. These solutions should be replaced at least once each month.

19.2 *Secondary Standard Buffers*, may be prepared from NIST salts or purchased as solutions from commercial vendors. These commercially available solutions have been validated by comparison to NIST standards and are recommended for routine use.

20. Calibration and Standardization

20.1 Each instrument/electrode system must be calibrated at two points that bracket the expected pH of the samples and are approximately three pH units or more apart. Various instrument designs may involve use of a balance or standardize dial or slope adjustment as outlined in the manufacturer's instructions. Repeat adjustments on successive portions of the two buffer solutions until readings are within 0.05 pH units of the buffer solution values.

NOTE 2—Wide variation in the stirring speed may cause fluctuations in pH measurements, but the variations will not affect test accuracy.

20.2 Place the liquid sample or buffer solution in a glass beaker using a sufficient volume to cover the sensing elements or the electrodes and to give adequate clearance for the magnetic stirring bar. If field measurements are being made, the electrodes may be immersed directly in the sample

stream to an adequate depth and moved in a manner to ensure sufficient sample movement across the electrode-sensing element as indicated by drift free (less than 0.1 pH) readings during the analysis.

20.3 If the sample temperature differs by more than 2°C from the buffer solution, the measured pH values must be corrected. Instruments are equipped with automatic or manual compensators that electronically adjust for temperature differences. Refer to manufacturer's instructions.

21. Procedure

21.1 Because of the wide variety of pH meters and accessories, detailed operation procedures cannot be incorporated into this test method. Each analyst must be acquainted with the operation of each system and familiar with all instrument functions. Special attention to care of the electrodes is recommended.

21.2 Thoroughly rinse and gently wipe the electrodes prior to measuring pH of each sample. Immerse the electrodes into the sample beaker or sample stream and gently stir at a constant rate to provide homogeneity and suspension of solids (see Note 3). Note and record sample pH and temperature. Repeat measurement on successive volumes of sample until values differ by less than 0.1 pH un[illegible]o three volume changes are usually sufficient.

NOTE 3—Wide variation in stirring speed may cause fluctuation pH measurements but the variations will not adversely affect applicability.

21.3 *Aqueous Liquid*—Insert the electrode into aqueous portion of the waste and report the instrum reading.

21.4 *Solids, sludges, and non-aqueous liquids:*

21.4.1 Mix approximately a 10 % slurry of waste in wa and take measurement on the aqueous portion. (See 8.1.

21.4.2 For pH determination, refer to 21.2.

22. Quality Control

22.1 Instrument performance standards (where ap cable), quality control check samples of appropri matricies, and duplications, should be performed at action level specified by the laboratory at an appropri frequency.

23. Precision and Bias

23.1 The data are being accumulated and will be added the test method when completed.

Designation: D 3278 – 89

Standard Test Methods for Flash Point of Liquids by Setaflash Closed-Cup Apparatus[1]

This standard is issued under the fixed designation D 3278; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

This standard has been approved for use by agencies of the Department of Defense. Consult the DoD Index of Specifications and Standards for the specific year of issue which has been adopted by the Department of Defense.

1. Scope

1.1 These test methods cover procedures for determining whether a material does or does not flash at a specified temperature or for determining the lowest finite temperature at which a material does flash when using a Setaflash Tester. The test methods are applicable to paints, enamels, lacquers, varnishes, and related products having a flash point between 32 and 230°F (0 and 110°C) and viscosity lower than 150 St at 77°F (25°C).

NOTE 1—Tests at higher or lower temperatures are possible.

NOTE 2—More viscous materials may be tested in accordance with Annex A4.

NOTE 3—Organic peroxides may be tested in accordance with Annex A5, which describes the applicable safety precautions.

NOTE 4—The U.S. Department of Labor (OSHA, Hazard Communications), the U.S. Department of Transportation (RSPA), and the U.S. Environmental Protection Agency (EPA) have specified Test Methods D 3278 as one of several acceptable methods for the determination of flash point of liquids in their regulations.

NOTE 5—These test methods are similar to International Standards ISO 3679 and ISO 3680.

1.2 *This standard should be used to measure and describe the properties of materials, products, or assemblies in response to heat and flame under controlled laboratory conditions and should not be used to describe or appraise the fire hazard or fire risk of materials, products, or assemblies under actual fire conditions. However, results of this test may be used as elements of a fire risk assessment which takes into account all factors pertinent to an assessment of the fire hazard of a particular end use.*

1.3 *This standard may involve hazardous materials, operations, and equipment. This standard does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.* For specific hazard statements, see Notes 7 and 12.

2. Referenced Documents

2.1 *ASTM Standards:*

D 56 Test Method for Flash Point by Tag Closed Tester[2]

D 93 Test Methods for Flash Point by Pensky-Martens Closed Tester[2]

D 850 Test Method for Distillation of Industrial Aromatic Hydrocarbons and Related Materials[3]

D 1015 Test Method for Freezing Points of High-Purity Hydrocarbons[2]

D 1078 Test Method for Distillation Range of Volatile Organic Liquids[3]

2.2 *ISO Standards:*[4]

ISO 3679 Paints, varnishes, petroleum and related products—Determination of flash point—Rapid equilibrium method

ISO 3680 Paints, varnishes, petroleum and related products—Flash/no flash test—Rapid equilibrium method

3. Terminology

3.1 *Definitions:*

3.1.1 *flash point*—the lowest temperature, corrected to a pressure of 760 mm Hg (101.3 kPa, 1013 mbar), at which application of an ignition source causes the vapor of the specimen to ignite under specified conditions of test.

4. Summary of Test Methods

4.1 By means of a syringe, 2 mL of the sample is introduced through a leakproof entry port into the tightly closed Setaflash Tester or directly into the cup that has been brought to the required test temperature. As a flash/no flash test, the expected flash point temperature may be a specification or other operating requirement. After 1 min, a test flame is applied inside the cup and note is taken whether or not the test specimen flashes. A fresh specimen must be used if a repeat test is necessary.

4.2 For a finite flash point measurement, the temperature is sequentially increased through the anticipated range, the test flame being applied at 9°F (5°C) intervals until a flash is observed. A true determination is then made using a fresh specimen, starting the test at the temperature of the last interval before the flash point of the material and making tests at increasing 1°F (0.5°C) intervals.

5. Significance and Use

5.1 Flash point is one of the properties used to define the flammability of a liquid. It is used to classify liquids according to their flammability by governmental regulatory

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These test methods are under the jurisdiction of ASTM Committee D-1 on Paint and Related Coatings, Materials, and Applications and are the direct responsibility of Subcommittee D01.22 on Health and Safety.

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[2] *Annual Book of ASTM Standards*, Vol 05.01.

[3] *Annual Book of ASTM Standards*, Vol 06.04.

[4] Available from American National Standards Institute, 13th Floor, 11 W. 42nd St., New York, NY 10036.

agencies. It may also be used to determine the presence of impurities or contaminants in a given liquid, such as the presence of residual solvents in solvent-refined drying oils.

6. Apparatus

6.1 *Setaflash Tester*,[5] shown in Fig. A1.1 and described in Annex A1.

6.2 *Thermometers*,[6] low, medium, high temperature Setaflash. Test to determine that the scale error does not exceed 0.5°F (0.25°C). The use of a magnifying lens assists in making temperature observations.

6.3 *Glass Syringe*, 2 ± 0.1-mL capacity at 77°F (25°C), to provide a means of taking a uniform specimen. Check the capacity by discharging water into a weighing bottle and weighing. Adjust plunger if necessary. A disposable syringe of equal precision may be used.

6.4 *Aluminum Cooling Block*[7] (describing in Annex A2), that fits snugly within the test cup used for rapid cooling of the sample cup.

6.5 *Barometer.*

7. Reagents and Materials

7.1 *p-Xylene*,[8] reference standard.

7.2 *n-Butanol*,[9] reference standard.

7.3 *Cooling Mixtures* of ice and water or solid CO_2 (dry ice) and acetone.

7.4 *Liquified Petroleum Gas.*

7.5 *Heat Transfer Paste.*[10]

8. Sampling

8.1 The specimen size for each test is 2 mL. Obtain at least a 25-mL sample from the bulk source and store in a nearly full, tightly closed, clean glass container or in other container suitable for the type of liquid being sampled.

NOTE 6: **Caution**—Erroneously high flash points may be obtained if precautions are not taken to avoid loss of volatile material. Do not open sample containers unnecessarily and do not transfer the specimen to the cup unless the temperature of the specimen is at least 20°F (10°C) below the expected flash point. Discard samples in leaky containers.

NOTE 7: **Precaution**—Do not store samples in plastic bottles (polyethylene, polypropylene, etc.), as volatile material may diffuse through the walls.

9. Preparation of Apparatus

9.1 Prior to initial use or after removal of the thermometer, insert the thermometer into its pocket (see Fig. A1.1) with a good heat transfer paste.

9.2 To help in making the necessary settings during a test, before the initial use determine the relationship between the temperature control dial and thermometer readings at intervals not over 9°F (5°C) throughout the scale range of the heater.

9.3 Place the tester in a subdued light and p[illegible] not exposed to disturbing drafts. Provide a black-shield, if necessary.

9.4 Read the manufacturer's operating and maint[illegible] instructions on the care and servicing of the tester. O[illegible] the specific suggestions regarding the operation of the v[illegible] controls.

9.5 Check the accuracy of the tester by duplicate de[illegible] nation of the flash point of the *p*-xylene reference sta[illegible] (Annex A3). The mean of the results should be 81 ± [illegible] (27.2 ± 0.8°C). An additional reference standard, *n*-bu[illegible] (Annex A3), may be used to check the accuracy at ap[illegible] mately the temperature specified by U.S. regulatory ag[illegible] in defining flammable liquids. The mean of dupl[illegible] should be 98 ± 1.5°F (36.7 ± 0.8°C). If not, remo[illegible] thermometer and observe whether sufficient heat tr[illegible] paste surrounds the thermometer to provide good[illegible] transfer from the cup to the thermometer.

TEST METHOD A—FLASH/NO FLASH

10. Procedure—Ambient to 230°F (110°C)

10.1 Inspect the inside of the test cup, lid, and sh[illegible] mechanism for cleanliness and freedom from contar[illegible] tion. Use an absorbent tissue to wipe clean, if nece[illegible] Lock the cover lid tightly in place.

10.2 Switch the heater on, if not already at s[illegible] by[illegible] rapidly approach the specification flash temper[illegible] o[illegible] material under test, turn the heater dial fully clockwise ([illegible] 8) causing the heater signal (red) light to glow. Whe[illegible] thermometer indicates a temperature of about 5°F [illegible] below the specification or target flash-point tempera[illegible] reduce the heat input to the test cup by slowly turnin[illegible] heater control dial counter clockwise until the signal[illegible] goes out (Note 9).

NOTE 8—When a desired temperature is dialed on the controlle[illegible] elapsed time to reach this temperature may be greater than i[illegible] controller is turned "full on," but less attention is required.

NOTE 9—The test cup temperature is stable when the signal[illegible] slowly cycles on and off.

10.3 Determine the barometric pressure to determine[illegible] corrected specification temperature at that barometric p[illegible] sure (see 15.1).

10.4 After the test-cup temperature has stabilized at[illegible] specification or target flash point, charge the syringe with[illegible] sample being tested and insert the tip of the syringe into[illegible] filling orifice (Fig. A1.2), taking care not to lose any mate[illegible] Discharge the specimen into the test cup by comple[illegible] depressing the syringe plunger, then remove the syringe[illegible] the material has a viscosity greater than 45 SUS at 10[illegible] (38°C) or equivalent of 9.5 cSt at 77°F (25°C), raise the[illegible] and discharge the contents of the syringe directly into[illegible] cup. Immediately close the lid tightly.

10.5 Set the 1-min timing device. In the mean[illegible] o[illegible] the gas control valve and light the pilot and t[illegible] in[illegible] Adjust the test flame size with the pinch valve to match[illegible] size of the 5/32-in. (4-mm) diameter flame gage.

10.6 After 1 min has elapsed, observe the temperatur[illegible] at the specification temperature (accounting for the di[illegible]

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[5] Closed-cup flash point testers and their accessories meeting the requirements of the unit shown in Fig. A1.1 are available from ERDCO Engineering Corp., 721 Custer Ave., Evanston, IL 60202 or Stanhope-Seta Ltd., Park Close Englefield Green, Engham, Surrey, TW20 OXD, England.

[6] Thermometers may be obtained from the suppliers of the Setaflash Tester.

[7] Cooling blocks may be obtained from ERDCO Engineering Corp.

[8] *p*-Xylene is available as "Flash Point Creek Fluid" from Special Products Div., Chemical Dept., Phillips Petroleum Co., Borger, TX 25303.

[9] *n*-Butanol may be obtained from chemical supply companies.

[10] Heat transfer paste is available from the suppliers of the Setaflash Tester. No. 340 Silicone is available from Dow Corning Corp., 2030 Willard H. Dow Center, Midland, MI 48674. G641 Heat Transfer Compound is available from General Electric Co., Products Div., 12 Corporate Woods Blvd., Albany, NY 12211.

of the barometer reading from 760 mm), apply the test flame by slowly and uniformly opening the slide fully and closing completely over a period of approximately 2½ s (Note 10), watching for a flash (Note 11) while the flame is inserted.

NOTE 10—When inserted, the nozzle of the ignition device should intersect the plane of the underside of the cover (see A1.1).

NOTE 11—The material is considered to have flashed only if a comparatively large blue flame appears and propagates itself over the surface of the liquid. Occasionally, particularly near the actual flash-point temperature, application of the test flame may give rise to a halo; this effect should be ignored.

10.7 Turn off the test and pilot flame. Clean the apparatus in preparation for the next test.

11. Procedure—32°F (0°C) to Ambient

11.1 If the specification or target flash point is at or below ambient temperature, cool the sample to 10 to 20°F (5 to 10°C) below that point by some convenient means.

11.2 Cool the tester to approximately the temperature of the sample by inserting the cooling block (Fig. A2.1) filled with a cooling mixture (Notes 12 and 13) into the sample well. Dry the cup with a paper tissue to remove any collected moisture prior to adding the specimen using a precooled syringe.

NOTE 12: **Precaution**—Be careful in handling the cooling mixture and cooling block; wear gloves and goggles. Mixtures such as dry ice and acetone can produce severe frost bite.

NOTE 13: **Caution**—Be careful when inserting the cooling block into the cup to prevent damage to the cup.

11.3 Introduce the specimen as in 10.4. Allow the temperature to rise under ambient conditions or increase the temperature of the cup by rotating the heater controller clockwise slowly until the specification temperature adjusted for barometric pressure is reached. Determine whether the material flashes as in 10.5 and 10.6.

11.4 Turn off the test and pilot flames. Clean the apparatus.

TEST METHOD B—FINITE FLASH POINT

12. Procedure—Ambient to 230°F (110°C)

12.1 *Preliminary or Trial Test:*

12.1.1 Follow steps 10.1 to 10.5, omitting the barometric reading and using an estimated finite flash point instead of specification flash-point temperature.

12.1.2 After 1 min has elapsed, observe the temperature. Apply the test flame by slowly and uniformly opening the slide fully and closing completely over a period of 2½ s (Note 10), watching for a flash (Note 11) while the flame is inserted.

12.2 If a flash is observed, proceed as in 12.3. If no flash is observed, proceed as in 12.4.

12.3 Using a temperature 9°F (5°C) lower than the temperature observed in 12.1.2, repeat 12.1 (Note 4). If a flash is observed, repeat at 9°F lower intervals until no flash is observed.

NOTE —Never make a repeat test on the same specimen. Always take a portion for each test.

12.3.1 After establishing the approximate flash point, repeat 12.1 with a new specimen, but stabilizing the test temperature at which no flash occurred previously. Observe if a flash occurs at this temperature. If not, increase the temperature by making a small adjustment to the temperature controller so that an increase of 1°F (0.5°C) occurs within 1 min. Test for a flash at each 1°F interval, recording the temperature at which the flash actually occurs. Record the barometric pressure. Clean the tester.

12.3.1.1 Repeat 12.3.1 with a new specimen. Calculate the corrected mean temperature in accordance with 15.2. Turn off pilot and test flames and clean the tester.

12.4 Using a test temperature 9°F (5°C) higher than the temperature observed in 12.2, repeat 12.1 (Note 14). If no flash is observed, repeat at 9°F higher intervals until a flash is observed.

12.4.1 After establishing the approximate flash point (12.4) with new specimens, make two determinations of the flash point in accordance with 12.3.1 and calculate the corrected mean temperature in accordance with 15.2.

13. Procedure—32°F (0°C) to Ambient Temperature

13.1 *Preliminary or Trial Test:*

13.1.1 Cool the sample to 5 to 10°F (3 to 5°C) below the expected flash point.

13.1.2 Cool the tester to approximately the temperature of the sample by inserting the cooling block filled with a cooling medium into the sample well. (**Precaution**—See Notes 12 and 13.)

13.1.3 Introduce the specimen using a precooled syringe as in 10.4. Set the 1-min timing device. After 1 min observe the temperature, then apply the test flame by slowly and uniformly opening the slide fully and closing completely over a period of 2½ s, watching for a flash (Note 11) while the flame is inserted. Record the temperature.

13.2 If a flash is observed, proceed as in 13.3. If no flash is observed, proceed as in 13.4.

13.3 Take a new specimen and recool the sample cup to 9°F (5°C) below the previous temperature (13.1.3). After 1 min, check for a flash as in 13.1.3. If the material flashes, repeat at 9°F lower intervals until no flash is observed.

13.3.1 After establishing the approximate flash point, repeat 13.1.1 and 13.1.3 with a new specimen but stabilizing the test temperature at which no flash occurred previously. Observe if a flash occurs at this temperature. If not, increase the temperature by making a small adjustment to the temperature controller so that an increase of 1°F (0.5°C) occurs within 1 min. Test for a flash at each 1°F interval, recording the temperature at which the flash actually occurs. Record the barometric pressure.

13.3.1.1 Repeat 13.3.1 with a new specimen. Calculate the corrected mean in accordance with 15.2. Turn off pilot and test flames and clean the tester.

13.4 Using a test temperature 9°F (5°C) higher than the temperature observed in 13.1.3, repeat 13.1.3 (Note 14). If no flash is observed, repeat at 9°F higher intervals until a flash is observed.

13.4.1 After establishing the approximate flash point (13.4), make the determinations of the flash point in accordance with 13.3 and calculate the corrected mean in accordance with 15.2.

14. Clean-up of Apparatus and Preparation for Next Test

14.1 Unlock the lid assembly of the tester and raise to the hinge stop. Soak up liquid with an absorbent paper tissue and wipe dry. Clean the underside of the lid and filling orifice. A pipe cleaner may be of assistance in cleaning the orifice.

14.2 If the material is a viscous liquid or contains dispersed solids, after soaking up most of the specimen add a small amount of a solvent suitable for the sample to the cup. Then soak up the solvent and wipe clean the interior surfaces of the cup with an absorbent tissue paper.

NOTE 15—If necessary to remove residual high boiling solvent residues, moisten tissue with acetone and wipe dry.

NOTE 16—If any further cleaning is necessary, remove the lid and shutter assembly. Disconnect the silicone rubber hose and slide the lid assembly to the right to remove. If warm, handle carefully.

14.3 After the cup has been cleaned, its temperature may be rapidly increased to some stand-by value by turning the temperature control dial to an appropriate point.

NOTE 17—It is convenient to hold the test cup at some stand-by temperature (depending on planned usage) to conserve time in bringing the cup within the test temperature range. The cup temperature may be quickly lowered by inserting the aluminum cooling block filled with an appropriate cooling mixture into the cup.

14.4 The syringe is easily cleaned by filling it several times with acetone or other compatible solvent, discharging the solvent each time, and allowing the syringe to air dry with the plunger removed. Replace the plunger, and pump several times to displace any solvent vapor with air.

15. Correction for Barometric Pressure

15.1 Determine the corrected specification flash point to be used in Test Method A by the following equations:

$$F = S - 0.06\,(760 - P)$$
$$C = T - 0.03\,(760 - P)$$
$$F = S - 0.42\,(101.3 - B)$$
$$C = T - 0.23\,(101.3 - B)$$

where:

FC = flash point to be observed to obtain the specification flash point at standard pressure, °F (°C),
$S(T)$ = specification flash point, °F (°C), and
$P(B)$ = ambient barometric pressure, mm Hg (kPa).

NOTE 18—The barometric pressure used in this calculation must be the ambient pressure for the laboratory at the time of test. Many aneroid barometers, such as those used at weather stations and airports, are precorrected to give sea-level readings. These must not be used.

15.2 When the barometric pressure in Test Method B differs from 760 mm Hg, correct the flash point temperature, A, by means of the following equations:

$$A = F + 0.06\,(760 - P)$$
$$= C + 0.03\,(760 - P)$$
$$= F + 0.42\,(101.3 - B)$$
$$= C + 0.23\,(101.3 - B)$$

where:

$F(C)$ = observed flash point, °F (°C), and
$P(B)$ = ambient barometric pressure, mm Hg (kPa).

16. Report

16.1 When using the flash/no flash method, report whether or not the sample flashed at the required flash point and that Test Method A was used.

16.2 If an actual flash point was determined, repo mean of duplicate determinations to the neare (C provided the difference between the values doe . e 2°F (1°C) and that Test Method B was used.

17. Precision[11] and Bias

17.1 On the basis of an interlaboratory study of Method B in which one operator in each of five labora made two determinations on two different days on solvents, three resins and two paints of different flash p the within-laboratory and between-laboratory standard ations were found to be:

	Standard Deviatio	
Materials	Within-Laboratory	Betw Labor
Solvents (viscosity below 45 SUS at 100°F), °F	0.98	1.5
Resins and Paints (viscosity above 45 SUS at 100°F), °F	1.89	2.4

Based on these standard deviations, the following cr should be used for judging the acceptability of results a 95 % confidence level:

17.2 *Liquids at or Below 45 SUS at 100°F or Equiv Viscosity:*

17.2.1 *Repeatability*—Two results, each the mean o determinations, obtained by the same operator on diff days should be considered suspect if they differ by more 3°F (1.7°C).

17.2.2 *Reproducibility*—Two results, each th ea two measurements, obtained by different laborat should be considered suspect if they differ by more thar (3.3°C).

17.3 *Viscous Liquid Above 45 SUS at 100°F or Li With Dispersed Solids:*

17.3.1 *Repeatability*—Two results, each the mean of determinations, obtained by the same operator on diff days should be considered suspect if they differ by more 6°F (3.3°C).

17.3.2 *Reproducibility*—Two results, each the mea two measurements, obtained by different laboratories sh be considered suspect if they differ by more than 9°F (5

17.4 A study to determine the precision for materials a viscosity greater than 150 St has not been made.

17.5 The precision for liquid peroxides has not l determined, but the precision of liquid peroxides shoul similar to that of other liquids.

17.6 *Bias*—No estimate of the bias of flash-point tests be determined as no absolute values are available addition, the results are equipment and method depend

18. Keywords

18.1 flash point; Setaflash Closed-Cup; organic peroxi flash/no flash; *p*-xylene; *n*-butanol

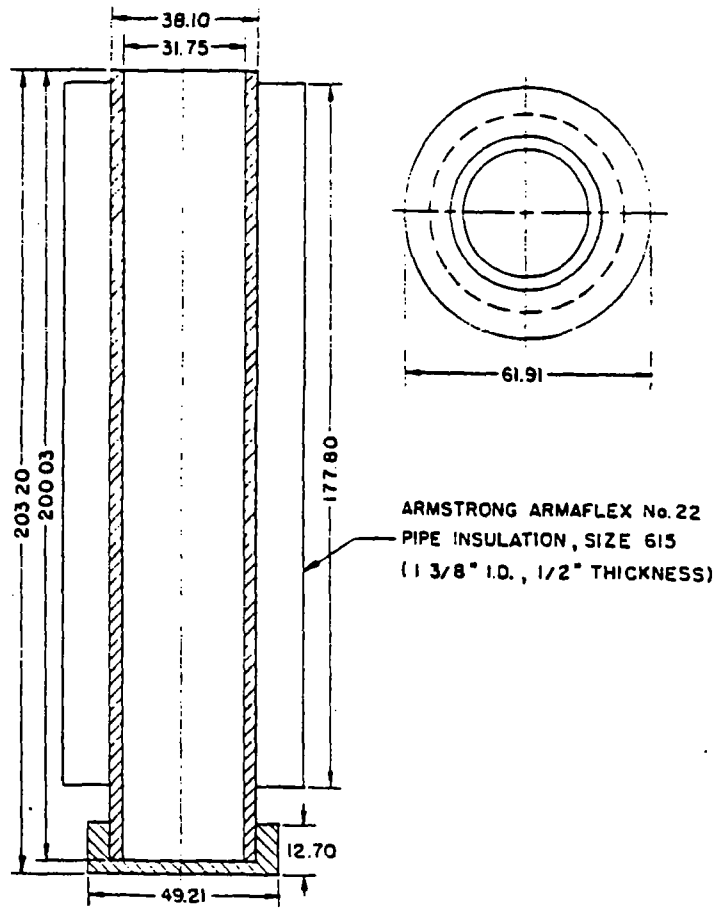
[11] Supporting data are available from ASTM Headquarters. Requ..t RR 1000. These data are also reported in the *Journal of Paint Technology*, Vol 4: 581, p. 44.

ANNEXES

(Mandatory Information)

A1. APPARATUS SPECIFICATIONS

A1.1 A typical apparatus is shown in Fig. A1.1. Electrical heaters are fastened to the cup in a way as to provide for efficient transfer of heat. The tester includes a variable heater control device with a scaled dial and a visible signal to indicate when energy is or is not being applied. Energy may be supplied from a 100 to 250 V 50/60 Hz (for stationary use) or by a 12-V d-c battery service (for field use). An adjustable test flame and a pilot flame to maintain the test flame are provided. These flames may be fueled by piped gas service (fixed location) or by a self-contained tank of liquefied petroleum gas (7.4) (for portability). A test flame measuring 5/32 in. (4 mm) in diameter may be checked against a gage ring on the surface of the tester. Never recharge the gas tank with the pilot or test flames lighted, nor in the vicinity of other naked flames. A 1-min audible signal is a desirable accessory. The cover is fitted with an opening slide device capable of inserting the ignition flame into the well when the slide is open. When inserted the nozzle of the ignition device shall intersect the plane of the underside of the cover.



NOTE—All dimensions are in millimetres.

FIG. A1.1 Setaflash Unit

A2. COOLING BLOCK

A2.1 The cooling block with dimensions as shown in Fig. A2.1 is made of aluminum and covered with pipe insulati

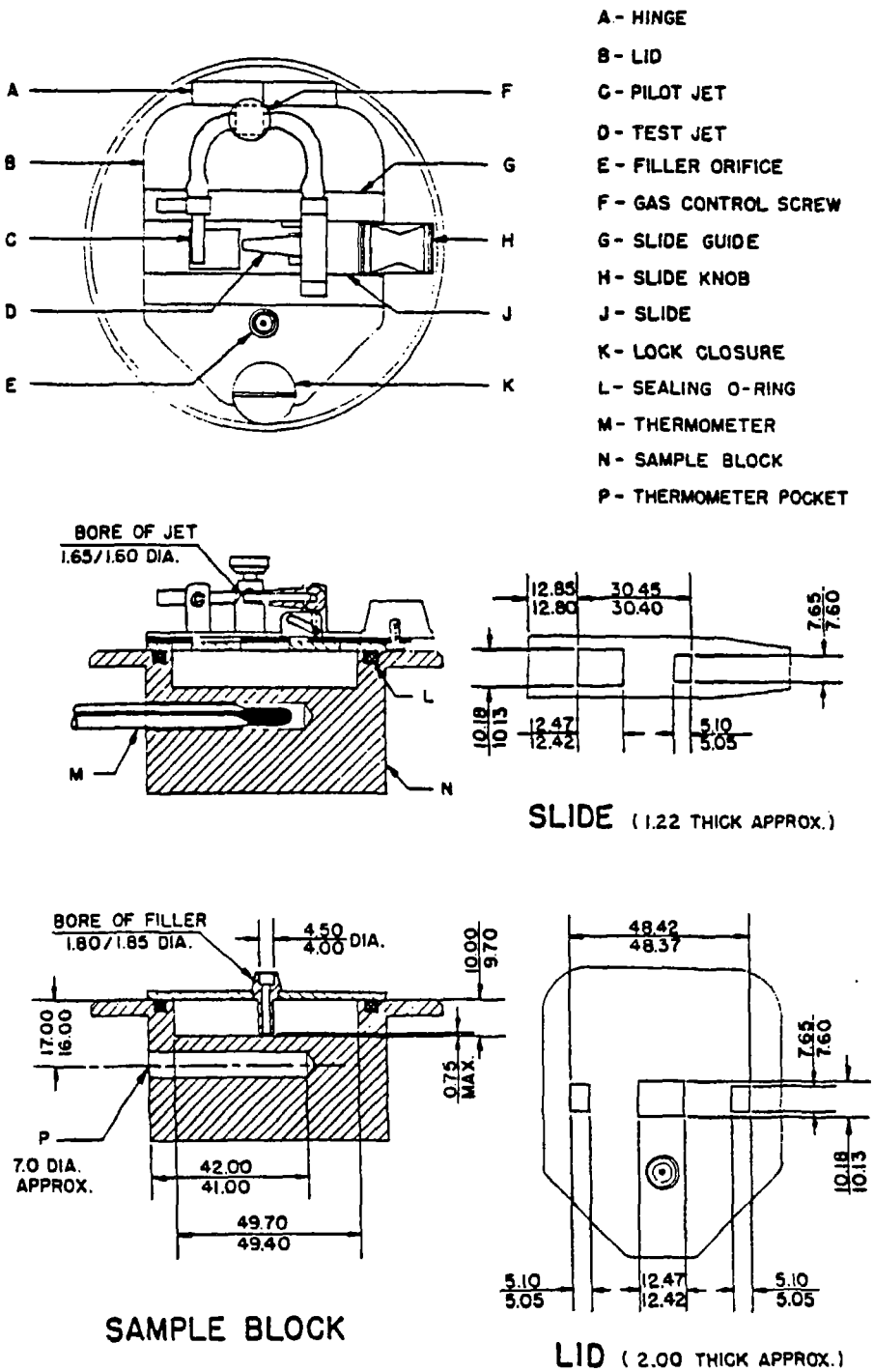


FIG. A2.1 Cooling Block

A3. SPECIFICATIONS FOR *p*-XYLENE AND *n*-BUTANOL REFERENCE STANDARDS

A3.1 *p*-Xylene

A3.1.1 *Specific Gravity, 60/60°F (15.56/15.56°C) Range*—0.860 minimum, 0.866 maximum.

A3.1.2 *Boiling Range*—2°C maximum from start to dry point when tested in accordance with Test Method D 850 or Test Method D 1078. The range shall include the boiling point of pure *p*-xylene, which is 138.35°C.

A3.1.3 *Freezing Point*—11.23°C minimum (95 % molal purity) as determined in accordance with Test Method D 1015.

A3.2 *n*-Butanol

A3.2.1 *Specific Gravity, 20/4°C Range*—0.809 minimum, 0.810 maximum.

A3.2.2 *Boiling Range*—1.5°C maximum from start to dry time determined in accordance with Test Method D 1078. The range shall include the boiling point of pure *n*-butanol, which is 117.7°C.

A3.2.3 *Melting Point Range*—−90°C minimum, −89.5°C maximum.

A3.2.4 *Refractive Index n 20/D Range*—1.3985 minimum, 1.3993 maximum.

A3.2.5 *Purity by Gas Chromatography*—99.5 % minimum.

A4. TESTING HIGH VISCOSITY LIQUIDS

A4.1 High-viscosity materials may be added to the cup by the following procedure:

A4.1.1 *Procedure*—Back load a 5 or 10-mL syringe with the sample to be tested and extrude 4 mL into the cup. Spread the specimen as evenly as possible over the bottom of the cup.

A4.1.2 If the sample cannot be loaded into a syringe and extruded, use other means of adding the specimen to the cup provided a presentative 4-mL specimen can be put into the cup. A spoon of appropriate size is convenient. Push the material from the spoon into the cup.

A4.1.3 If the test specimen does not seal off the bottom of the filling orifice, seal the orifice from the top by suitable means.

A4.2 Using Test Method A (Section 10 or 11), determine whether or not the material flashes or, using Test Method B (Section 12 or 13), determine the flash point of the specimen.

A5. TESTING ORGANIC PEROXIDES

A5.1 Organic peroxides may be tested by Test Methods A or B with minor modifications that take into account the hazard potential of these compounds.

A5.1.1 The tester should be located behind a transparent safety shield, and fire resistant gloves should be worn.

A5.1.2 The procedure in 10.1 is followed with the exception that the cover lid is not locked in place. Rather, a spring-wire test-tube holder is clamped to the hold-down lock on the lid to provide an extension arm about 5 in. (12.7 cm) long. A weight of approximately 100 g is hung from the end of the test tube holder. This arrangement adequately seals the test while allowing venting with a rapidly decomposing peroxide.

A5.1.3 Follow the procedures described in Test Methods A or B (Sections 10 through 14). However, when applying the test flame, grasp the handle by means of a second test tube holder, pliers, or tongs.

METHOD 9095

PAINT FILTER LIQUIDS TEST

1.0 SCOPE AND APPLICATION

1.1 This method is used to determine the presence of free liquids in a representative sample of waste.

1.2 The method is used to determine compliance with 40 CFR 264.314 and 265.314.

2.0 SUMMARY OF METHOD

2.1 A predetermined amount of material is placed in a paint filter. If any portion of the material passes through and drops from the filter within the 5-min test period, the material is deemed to contain free liquids.

3.0 INTERFERENCES

3.1 Filter media were observed to separate from the filter cone on exposure to alkaline materials. This development causes no problem if the sample is not disturbed.

4.0 APPARATUS AND MATERIALS

4.1 Conical paint filter: Mesh number 60 (fine meshed size). Available at local paint stores such as Sherwin-Williams and Glidden for an approximate cost of $0.07 each.

4.2 Glass funnel: If the paint filter, with the waste, cannot sustain its weight on the ring stand, then a fluted glass funnel or glass funnel with a mouth large enough to allow at least 1 in. of the filter mesh to protrude should be used to support the filter. The funnel is to be fluted or have a large open mouth in order to support the paint filter yet not interfere with the movement, to the graduated cylinder, of the liquid that passes through the filter mesh.

4.3 Ring stand and ring, or tripod.

4.4 Graduated cylinder or beaker: 100-mL.

5.0 REAGENTS

5.1 None.

6.1 All samples must be collected according to the directions in Chapter : of this manual.

6.2 A 100-mL or 100-g representative sample is required for the test. t is not possible to obtain a sample of 100 mL or 100 g that is ficiently representative of the waste, the analyst may use larger size ples in multiples of 100 mL or 100 g, i.e., 200, 300, 400 mL or g. ever, when larger samples are used, analysts shall divide the sample into -mL or 100-g portions and test each portion separately. If any portion tains free liquids, the entire sample is considered to have free liquids.

PROCEDURE

7.1 Assemble test apparatus as shown in Figure 1.

7.2 Place sample in the filter. A funnel may be used to provide support the paint filter.

7.3 Allow sample to drain for 5 min into the graduated cylinder.

7.4 If any portion of the test material collects in the graduated inder in the 5-min period, then the material is deemed to contain free uids for purposes of 40 CFR 264.314 and 265.314.

QUALITY CONTROL

8.1 Duplicate samples should be analyzed on a routine basis.

METHOD PERFORMANCE

9.1 No data provided.

.0 REFERENCES

10.1 None required.

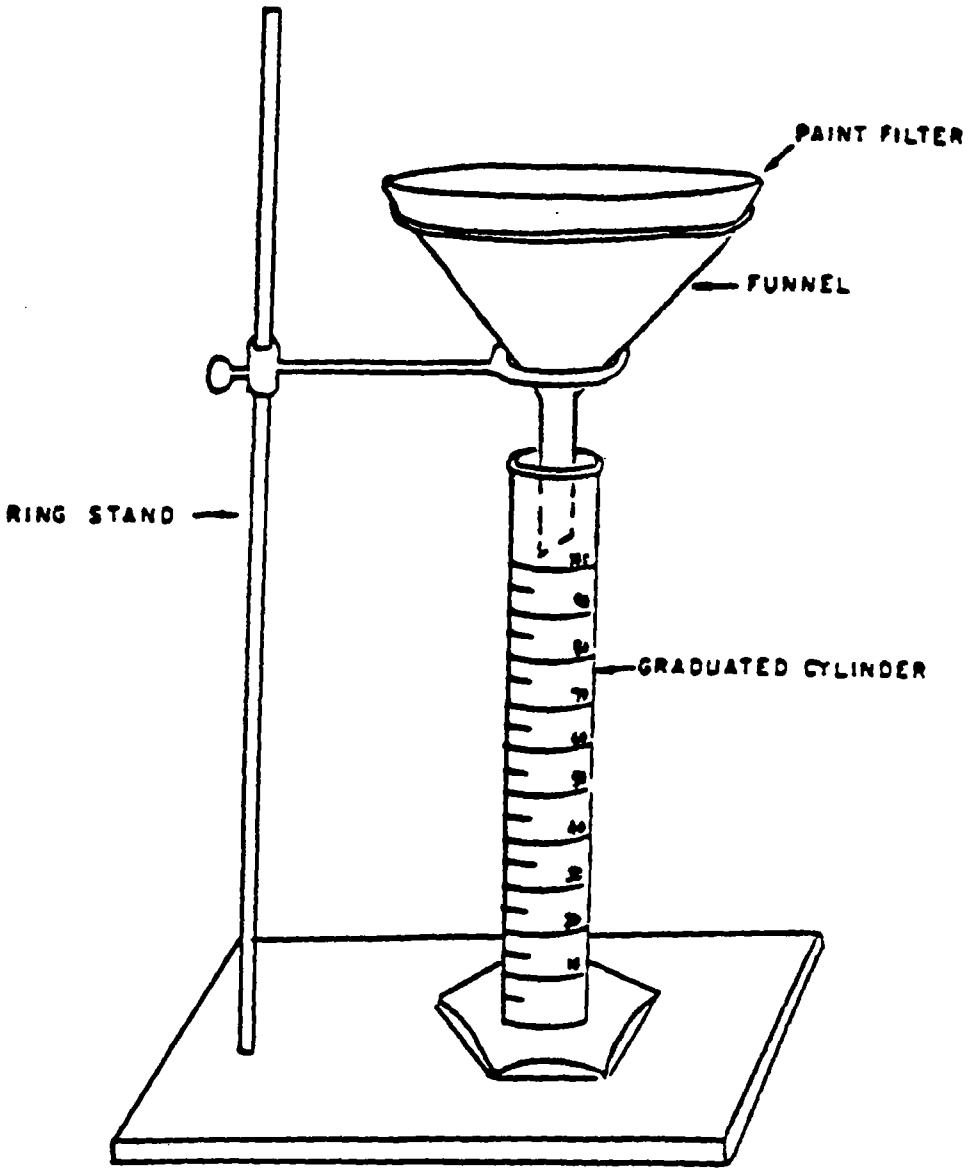
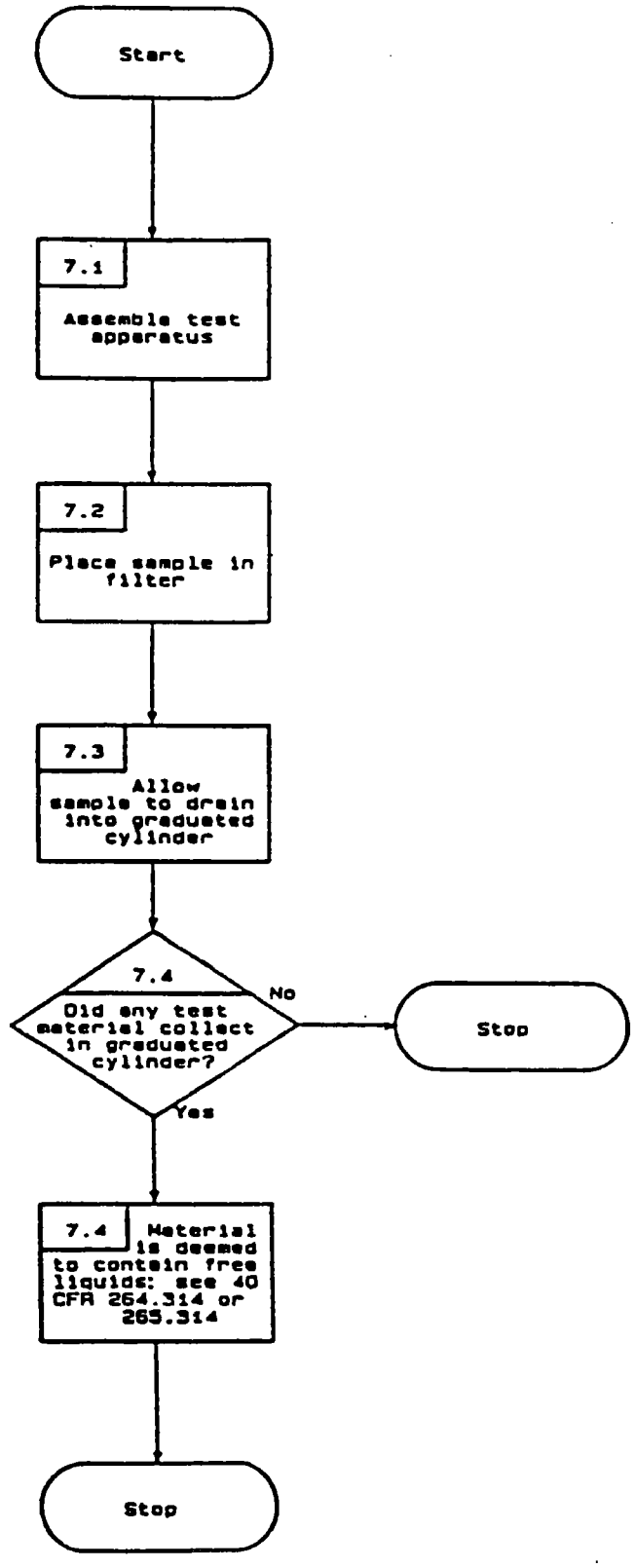


Figure 1. Paint filter test apparatus.

METHOD 9095

PAINT FILTER LIQUIDS TEST



ATTACHMENT C-5

SAMPLE GENERATOR WASTE MATERIAL PROFILE SHEET

GENERATOR WASTE MATERIAL PROFILE SHEET

DETREX CORPORATION

Solvents and Environmental Services Division

Waste Stream approval number: _____ **Date:** _____

SECTION I GENERATOR INFORMATION

Generator Name: _____ S.I.C. Code(s): _____ EPA ID#: _____
Facility Address: _____ City, ST, Zip: _____
Contact(s): _____ Telephone & Fax: _____

SECTION II SAMPLING INFORMATION

Date Sampled: _____ Time of Day & Temperature: _____
Type of Container (Bulk / Non-bulk): Drum Tote Tank Other: _____
Location of Container: inside heated unheated outside w/o covered roof outside w/ roof
Type of Sampling Device: _____ Was Sampling device clean: yes no
Method of sampling: _____ Sampled by* (PRINT CLEARLY): _____
Is label properly attached to sample?: yes no

SECTION III SHIPPING AND HANDLING INFORMATION

1. Check off the physical properties listed below that are NOT exhibited by the waste (NOTE: if waste exhibits any of the characteristics listed, contact a Detrex Representative before completing this form):
   a. Reactive b. Pyrophoric (4.2) c. Shock Sensitive d. Oxidizer (5) e. Explosive (1) f. Radioactive (7)
2. Container waste will be shipped in: Drum Tote Tank Other: (DM / DF / CF)_____
3. Shipment frequency: single shipment monthly annual anticipated volume: _____
4. USDOT information: Proper shipping name:
   _____ HC ____ UN/NA# _____ PG ____
5. EPA Reactivity Group number(s) _____

SECTION IV WASTE FINGERPRINT

1. Physical Characteristic of Waste at 70°F: Solid Liquid Layers pumpable free liquids (method 9095)
2. Characteristic odor of waste: none Description of odor _____
3. Color of Waste (USEPA method SW-846): _____
4. Density (include units): _____ Specific Gravity: _____
5. pH range (method 9040 or 9045): ≤2 >2-4.9 5-9.9 10-12.5 ≥12.5
6. Flash Pt.: ≤73°F 73°F – 140°F >140°F – < 200°F ≥200°F (if <140°F provide TOC and VOC analytical results)
7. Initial Boiling Point (°F/C): _____ (method 1010 – attach lab results)

SECTION V
HAZARDOUS WASTE CHARACTERISTICS & PROCESS GENERATING WASTE

1. Facility Common Waste Name: _____
2. Provide a DETAILED DESCRIPTION of the process generating the waste. Provide a flow diagram if necessary to provide additional details on process: _____
   _____
   _____
   _____ Source Code: A
3. Based on lab analysis and/or 'generator knowledge' of the process(es) generating the wastes, describe composition:

Constituent	*minimum%*	*to*	*maximum%*
_____	_____		_____
_____	_____		_____
_____	_____		_____
_____	_____		_____
_____	_____		_____

4. List any and all hazardous waste codes (FKDUP), including applicable state hazardous or special waste codes:
   _____ Form Code: B

SECTION VI FUEL BLENDING

Estimate the following characteristics of waste:
Water (%): _____ Solids (%): _____ **PCBs (total ppm):** _____ Heat value (BTU/lb.): _____
Sulfur (%): _____ Chlorine (%): _____ Ash (%): _____

GENERATOR WASTE MATERIAL PROFILE SHEET

DETREX CORPORATION

Solvents and Environmental Services Division

Waste Stream approval number: _____ **Date:** _____

SECTION VII CERTIFICATIONS

yes	no	Does the waste contain amenable to chlorination above 250 ppm?:
yes	no	Does the waste contain reactive sulfide above 500 ppm?:
yes	no	Is this waste a dioxin/furan waste as specified in 40 CFR 261.31
yes	no	This waste contained VOCs at the point of generation of less than 500-ppmw
yes	no	This waste has been treated such that the VOC concentration is currently below 500-ppmw

Check off the yes box listed below if TCLP testing has been conducted on the waste stream (attach lab results). For those constituents that the waste stream has come in contact with, it is reasonable to consider that the constituent may be present in the waste stream. ALL MATERIALS WITH WHICH THE WASTE STREAM COMES INTO CONTACT WITH HAVE BEEN CHECKED OR AN ANALYSIS WILL BE PROVIDED TO SHOW THE MATERIAL IS NOT IN THE WASTE STREAM.

Constituent		TCLP Regulatory Action Level (mg/l)	YES	NO
ACID EXTRACTABLES				
D023	0-Cresol*	200.0		
D024	m-Cresol*	200.0		
D025	p-Cresol*	200.0		
D026	Cresol	200.0		
D037	Pentachlorophenol	100.0		
D041	2,4,5-Trichlorophenol	400.0		
D042	2,4,6-Trichlorophenol	2.0		
METALS				
D004	Arsenic	5.0		
D005	Barium	100.0		
D006	Cadmium	1.0		
D007	Chromium	5.0		
D008	Lead	5.0		
D009	Mercury	0.2		
D010	Selenium	1.0		
D011	Silver	5.0		
ORGANICS				
D018	Benzene	0.5		
D019	Carbon Tetrachloride	0.5		
D021	Chlorobenzene	100		
D022	Chloroform	6.0		
D028	1,2-Dichloroethane	0.5		
D029	1,1-Dichloroethylene	0.7		
D035	Methyl Ethyl Ketone	200.0		
D039	Tetrachloroethylene	0.7		
D040	Trichloroethylene	0.5		
D043	Vinyl Chloride	0.2		

Constituent		TCLP Regulatory Action Level (mg/l)	YES	NO
BASE NEUTRAL EXTRACTABLES				
D027	1,4-Dichlorobenzene	7.5		
D030	2,4-Dinitrotoluene	0.13		
D032	Hexachlorobenzene	0.13		
D033	Hexachlorobutadiene	0.5		
D034	Hexachloroethane	3.0		
D036	Nitrobenzene	2.0		
D038	Pyridine	5.0		
PESTICIDES				
D020	Chlordane	0.03		
D012	Endrin	0.02		
D031	Heptachlor (&its Epoxide)	0.008		
D013	Lindane	0.4		
D014	Methoxychlor	10.0		
D015	Toxaphene	0.5		
HERBICIDES				
D016	2,4-D	10.0		
D017	2,4,5-TP (Silvex)	1.0		

CERTIFICATION

'Based upon my knowledge of the waste and the process generating the waste, these constituents are not present in the waste above hazardous classification levels'.

_____

_____

Print and Sign

I hereby authorize Detrex personnel to add supplemental information to their waste approval file provided I am contacted to give 'verbal' permission. I authorize Detrex to obtain a sample from any waste shipment for purposes of verification and confirmation. I further certify that all information (including attached information is complete and factual and is accurate representation of the known and suspected hazards, and waste generator regulations, pertaining to the waste described herein denoted by the certification signature.

Generator's Signature: _____ Date: _____

Print Name: _____ Company: _____

Title: _____

Facility Approval Signature: _____ Date: _____

TABLE OF CONTENTS

ATTACHMENTS

SECTION D
PROCESS INFORMATION

This section provides specific process information for the hazardous waste container storage area at the facility in Melrose Park, Illinois. The details are provided pursuant to Illinois Rule 35. The applicable section(s) of the Illinois Regulations are referenced as appropriate.

A hazardous waste container storage area is used to store wastes prior to transfer off-site. The entire operation is located within an enclosed building.

Hazardous wastes are received at the facility in DOT-approved containers (normally 55-gallon drums). Upon receipt all containers are transferred to an appropriate area in the hazardous waste container storage area.

A facility plan is presented in Attachment D-1. This figure locates the hazardous waste container storage area within the building.

D-1 CONTAINERS

Hazardous wastes are received at the facility in Department of Transportation (DOT)-approved shipping containers. Upon reciept containers, will initially be placed in a staging area for screening in accordance with the Waste Analysis Plan (Section C) and then transferred to the hazardous waste container storage area prior to transfer off site. Prior to transferring containers from a transport truck to the staging or storage area, waste already present in the area is evaluated to ensure potentially incompatiblity. The location of the container storage area and the staging area are shown on the facility plan provided in Attachment D-1. Only containers with compatible waste materials will be accepted for storage.

Each container in the hazardous waste container storage area is labeled (see sample label in Attachment D-2) according to its contents and manifest information. The location of the container storage area is shown in Attachment D-1.

Additional container storage areas are present in the facility, however, only virgin solvent products, non-hazardous waste, and empty containers are stored in these areas. Product labels are completely different to distinguish between product and waste containers.

D-1a Containers with Free Liquids

D-1a(1) Description of Containers [35 IAC 724.271, 724.272, 40 CFR 264.171, 264.172, 270.14 (b)(2)]

The facility only accepts and utilizes DOT-approved containers (49 CFR 178 Subparts D and H) for shipment and storage of hazardous waste. For a DOT-approved container to be accepted by the facility, it must meet the following conditions:

1) The container must not have any leaks;
2) The container must not have excessive corrosion or rust buildup which could, upon handling, result in leakage;
3) The container must not be excessively dented such that the usable volume is significantly less than its DOT description (e.g. 55 gallons for drums, 300 to 550 gallons for totes, etc.);
4) The container must be properly sealed with a suitable bung and gasket;
5) The container must be properly marked, labeled and manifested; and
6) It is the Generator's responsibility to ensure that a DOT-approved container is compatible with the hazardous waste contents. If upon examination personnel question the suitability of the container with its contents, Detrex will verify that the container is compatible with its contents by utilizing DOT's regulations set forth in 49 CFR Parts 172, 173, and 178.

In the event that an unsuitable container is received at the facility, based upon the above criteria, the container may be accepted if it is overpacked or other precautionary measures are implemented (e.g., contents transferred to a suitable DOT-approved

container). Overpacking involves the placing of the unsuitable container, with its contents, into a larger DOT-approved container that is suitable for that particular waste. For example, a 55-gallon drum may be overpacked into a 75 or 85-gallon overpack drum by lifting the 55-gallon drum via a forklift equipped with a sling or grappler and placing the drum into the overpack container.

When the facility delivers products using its own trucks, it is common practice to pick-up waste materials at the same time. Thus, the truck drivers are able to check each container at this time to see that the criteria outlined above are met. Containers not meeting this criteria would not be accepted.

The total capacity, in gallons, of hazardous waste stored in the hazardous waste container storage area will not exceed 13,200 gallons (calculation based on 24 X 550 gallon totes or 240 x 55-gallon drums). Normal shipments of hazardous waste are received in 55-gallon DOT-approved drums, however alternate container types and sizes, as specified in 49 CFR 178, are also acceptable.

If waste containers are received at the facility by other than Detrex trucks, the containers are inspected upon arrival, to ensure their conformance with the above listed requirements.

All of the hazardous wastes stored at the facility are compatible with the container.

D-1a(2) Container Management Practices
[35 IAC 724.273, 40 CFR 264.173]

Each container must meet the requirements specified previously in Section D-1a(1) to ensure there is no release of hazardous waste during shipment.

The material of construction of each container used will be as directed by the DOT (outlined in 49 CFR § 172, 173 and 178). Attachment D-3 provides some examples of the types of bulk and non-bulk containers required by the DOT for shipment of hazardous materials, including the materials of construction, as of October 2001 All containers will remain tightly sealed during staging or storage while in the container staging/storage area and will only be opened when the waste material is to be sampled or transferred.

When containerized wastes are received at the facility, they will be initially placed in the waste container staging area (see Attachment D-1). Containerized wastes will be screened according to the procedures discussed in Section C.

All containers will be stored such that the markings and labels are visible from the aisle. An aisle space of approximately 30 inches will be maintained in the Container Storage Area. If necessary, non-bulk containers will be stacked to a maximum of two

layers high. Only similar sized containers will be placed on the same pallet to ensure the stability when there is an overlying pallet. The inspection of DOT bulk and non-bulk containers for deterioration, such as leaks, is discussed in detail in Section F-2.

Storage of non-bulk containers (capacity less than or equal to 119 gallons, as defined by the DOT), such as 55-gallon drums, will depend on the size and quantity of containers. Small containers, such as 5-gallon pails, may be stacked on top of each other (to a height less than or equal to that of a 55-gallon drum) and then placed on top of a pallet of drums or on another pallet of similar containers. Bulk containers (portable tanks) stored in the container storage area are typically designed with skid mounts that allow for ease of movement and allow direct inspection for potential leaks. Portable tank containers (i.e., 300 to 550-gallon steel tote) will not be placed on pallets. Porta tanks containing material will not be stacked. As such, their handling will not create any problems.

Containers are transferred within the building by a forklift with a container handling attachment. Hand drum trucks may also be used to transport drums short distances.

There are no ignitable, reactive or incompatible hazardous wastes handled at this facility.

The following procedures are followed whenever Detrex is receiving and/or hauling hazardous wastes:

1. Detrex accepts only properly manifested and labeled shipments that are accompanied with proper notification, if necessary, and meet the container condition requirements outlined in Section D-1a(1);
2. Only hazardous wastes as listed in Attachment C-1 are accepted at the Facility;
3. The manifest is signed and dated. One copy of the signed manifest is given immediately to the transporter, if the transporter is someone other than Detrex. One copy is returned to the waste generator within 30 days and one copy is retained at the facility for a period of at least 3 years;
4. Shipments are recorded in the Customer Hazardous Waste Shipment Ledger upon receipt at the facility;
5. A sample is taken from each container, per the waste analysis plan in Section C, for analysis; and
6. Containers are stored in the properly designated, secured area. Once fingerprint analysis confirms the waste matches the information in the profile, the waste material is shipped out for reclamation (recycling) at an off-site Detrex facility or to an off-site permitted treatment/disposal facility, as appropriate.

D-1a(3) Secondary Containment System Design and Operation
[35 IAC 703.201(a)(1), 724.275(a) and (d), 40 CFR 270.15(a)(1), 264.175(a), 264.175(d)]

The interior secondary containment system consists of a minimum 4-inch thick concrete slab. The entire floor is of original construction. Ramps, to allow access to the different containment areas by forklifts and hand trucks, will be constructed at the locations shown in Attachment D-1. Cross-sectional details of the interior secondary containment systems (i.e., concrete dikes and ramps) are provided in Attachment D-4.

All containerized hazardous wastes are placed in the designated hazardous waste container storage area as shown in Attachment D-1 after passing waste characterization. The container storage area is located inside an enclosed building. The building floor, including the container storage area, is constructed of concrete.

A 3 1/2-inch high concrete dike, and 3 ½ inch high ramps, provides secondary containment for the hazardous waste container storage area, as shown in Attachment D-1. The concrete access ramps are provided at two locations of this dike and at the two doorways on the north wall of the building to provide access for equipment (i.e. forklift) while maintaining secondary containment.

D-1a(3)(a) Requirements for the Base or Liner to Contain Liquids
[35 IAC 724.275(a)(1), 40 CFR 264.175(b)(1)]

The building floor, including the container storage area, is constructed of concrete with a concrete dike to provide secondary containment in the container storage area. Concrete provides an essentially impervious base for the contained wastes as well as being compatible with each type of waste stored in the facility. There are no expansion or control joints in the floor slab and the surface is free of cracks and gaps. All doorways are diked with concrete ramps to maintain secondary containment while allowing for easy movement of equipment. The container storage area diking, and diked doorways are located on Attachment D-1. There are no floor drains or other such openings in the secondary containment area.

The base of the secondary containment area will be provided with a concrete sealant compound which is compatible with the materials stored in the facility. The sealant will be applied in accordance with the manufacturers instructions. The specifications of the selected sealant are provided in Attachment D-5.

This facility was originally constructed as an industrial building. Assuming a conservatively low design of a 5-inch thick, non-reinforced concrete floor slab for the facility, the modulus of rupture (M.R.) for such a slab is approximately 579 psi. The total factored wheel load based on conservatively high use and weight load of the existing forklift is 402.5 psi. This provides a factor of safety for the assumed concrete floor slab of 1.44. This indicates that at a minimum design standard, the existing floor slab is

adequate. This fact is further illustrated since the slab has performed without structured problems for at least 15 years.

D-1a(3)(b) Containment System Drainage
[35 IAC 703.201(a)(2), 724.275(b)(2),40 CFR 270.15(a)(2), 264.175(b)(2)]

Non-bulk DOT containers within the container storage area are placed on wooden pallets to elevate them off the concrete floor. Bulk containers (portable tanks) are typically designed with skid mounts that allow for ease of movement and allow direct inspection for potential leaks. Containers are also provided with adequate aisle space to allow for routine inspection. If an inspector discovers the presence of liquid, clean-up will be conducted. If necessary, the forklift can be used to move containers in order to complete the necessary clean-up.

D-1a(3)(c) Containment System Capacity
[35 IAC 703.201(a)(3), 724.275(b)(3),
40 CFR 270.15(a)(3), 264.175(b)(3)]

The conservative estimate of the total capacity of the secondary containment system at the facility is approximately 12,000 gallons (Attachment D-6 provides the calculations, a facility drawing showing the dimensions and the arrangement of the containers within the container storage area). The maximum volume of containerized hazardous waste stored at the facility is 13,200 gallons (based on 24 X 550-gallons Totes).

Pursuant to the regulations [35 1AC 724.275(b)(3)], the containment system must have sufficient capacity to contain ten percent (10%) of the volume of containers, or the volume of the largest container, whichever is greater. Thus, adequate containment is provided by the secondary containment system for the container storage area.

D-1a(3)(d) Control of Run-on
[35 IAC 703.201(a)(4), 724.275(b)(4), 40 CFR 270.15(a)(4),
264.175(b)(4)]

Run-on into the containment system for the container storage area is eliminated by the building structure. All precipitation is controlled outside of the facility and drainage is promoted away from the building in all areas except the concrete driveway. In this area drainage is toward the facility, however, it is controlled via a catchbasin that discharges to the 18-inch diameter combined sewer on LeMoyne Avenue in front of the facility. The catchbasin is covered by an 18-inch round drainage lid. The catchbasin is provided with a standard sump below the invert of the direct discharge line to the LeMoyne Avenue sewer.

During unloading/loading operations within the truck dock (see Attachment D-1), care is taken to prevent contaminated liquid from discharging to the sewer system from the catchbasin in the event of a spill. During all container unloading/loading operations, a 1/4-inch thick polypropylene pad is placed over the catchbasin. The polypropylene pad prevents liquids from entering the catchbasin in the event of a spill. Additionally, absorbent material is readily available to soak up any spilled liquids if required.

D-1a(4) Removal of Liquids from Containment System
[35 IAC 703.201(a)(5), 724.275(b)(5), 40 CFR 270.15(a)(5), 264.175(b)(5)]

Routine inspections for the presence of spilled or leaked materials within the secondary containment system are conducted. The inspection items and schedule are presented in Section F of this permit application. As required, accumulated liquids, if any, are collected from the secondary containment system with pumps and/or absorbent material. Collected material is containerized and stored in the hazardous waste container storage area, prior to transfer to an off-site Detrex reclamation (recycling) facility or to an off-site permitted treatment/storage facility.

D-1b Containers Without Free Liquids
[35IAC703.201(b), 40 CFR 270.15(b)(1)]

Most of the wastes to be stored or treated at the facility are liquid wastes. Solid wastes may also be accepted for storage or solids may be present with liquids inside waste containers (i.e., sludge).

Screening procedures for solids wastes are described in Section C-2. In the event visual evidence during sampling indicates the potential presence of free liquids within a container designated as a solid waste, a paint filter test maybe conducted.

D-1b(2) Description of Containers
[40 CFR 264.171, 264.172]

The same DOT-approved containers identified in Section D-1a(1) may be utilized.

D-1b(3) Container Management Practices
[40 CFR 264.173]

The containers will be managed in the same manner as described in Section D-1a(2).

D-1b(4) Container Storage Area Drainage
[40 CFR 270.15(b)(2), 264.175(c)]

In addition to the procedures documented in Section D-1a(3)(b) the entire container storage areas are enclosed within a single building. Therefore, for containers with no free liquids, there are no liquids present which may require drainage.

D-2 TANK SYSTEMS [35IAC703.202] [40 CFR 270.16; 264.191 THROUGH 264.194]

Detrex Corporation does not and has never utilized tanks for hazardous waste storage at the facility in Melrose Park, Illinois. Hence, a permit for storage tanks is not requested.

D-3 WASTE PILES [35 IAC 703.204] [40 CFR 270.18, 264.250 through 264.259]

Detrex Corporation does not and has never had a hazardous waste pile at the facility in Melrose Park, Illinois; hence, a permit for a waste pile is not requested.

D-4 SURFACE IMPOUNDMENTS [35 IAC 703.203]

Detrex Corporation does not and has never had a hazardous waste surface impoundment at the facility in Melrose Park, Illinois; hence, a permit for a surface impoundment is not requested.

D-5 INCINERATORS [35 IAC 703.205] [40 CFR 270.19, 264.340 through 264.350]

Detrex Corporation does not and has never had a hazardous waste incinerator at the facility in Melrose Park, Illinois; hence, a permit for an incinerator is not requested.

D-6 LANDFILLS [35 IAC 703.207] [40 CFR 270.21, 264.300 through 264.317]

Detrex Corporation does not and has never had a hazardous waste landfill at the facility in Melrose Park, Illinois; hence, a permit for a landfill is not requested.

D-7 LAND TREATMENT [35 IAC 703.206] [40 CFR 270.20, 264.270 through 264.283]

Detrex Corporation does not and has never had a hazardous waste land treatment operation at the facility in Melrose Park, Illinois; hence, a permit for land treatment is not requested.

D-8 MISCELLANEOUS UNITS [40 CFR 264.601, 270.33]

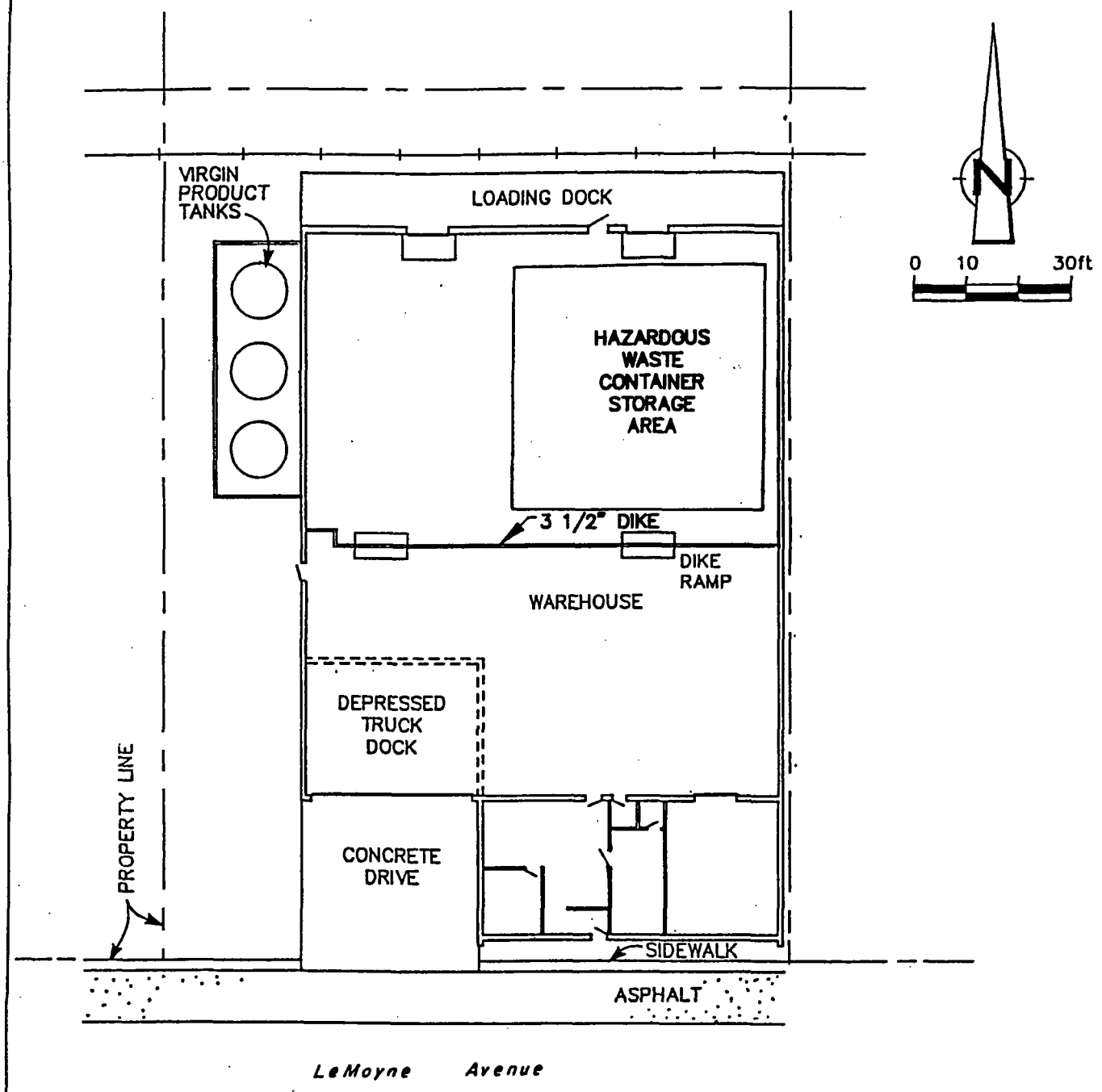
Not applicable for this facility.

D-9 BOILERS AND INDUSTRIAL FURNACES (BIFs)

Not applicable for this facility.

D-10 CONTAINMENT BUILDINGS [40 CFR 260.10, 264.1100, 264.1101, 264.1102]

Not applicable for this facility.



FACILITY PLAN

Detrex Corporation

Melrose Park, Illinois Facility

CRA

ATTACHMENT D-2

TYPICAL HAZARDOUS WASTE CONTAINER MARKING

TYPICAL HAZARDOUS WASTE DRUM MARKING
PART B PERMIT APPLICATION
DETREX CORPORATION, INDIANAPOLIS, INDIANA

HAZARDOUS MATERIALS TABLE

Symbols	Hazardous materials descriptions and proper shipping names	Hazard class or Division	Identification Numbers	PG	Label Codes	Special provisions (§172.102)	(8) Packaging (§173.***)			Placards Consult regulations for specifics (Part 172, Subpart F) *Denotes placard for any quantity
							Exceptions	Non-bulk	Bulk	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8A)	(8B)	(8C)	
	Copper cyanide	6.1	UN1587	II	6.1	IB8, IP2, IP4	None	204	242	POISON
	Copper selenate, see **Selenates** *or* **Selenites**									
	Copper selenite, see **Selenates** *or* **Selenites**									
	Copper tetramine nitrate	Forbidden								
A W	**Copra**	4.2	UN1363	III	4.2	IB8, IP3, IP6	None	213	241	SPONTANEOUSLY COMBUSTIBLE
	Cord, detonating, *flexible*	1.1D	UN0065	II	1.1D	102	63(a)	62	None	EXPLOSIVES 1.1*
	Cord, detonating, *flexible*	1.4D	UN0289	II	1.4D		None	62	None	EXPLOSIVES 1.4
	Cord detonating *or* **Fuse detonating** *metal clad*	1.2D	UN0102	II	1.2D		None	62	None	EXPLOSIVES 1.2*
	Cord, detonating *or* **Fuse, detonating** *metal clad*	1.1D	UN0290	II	1.1D		None	62	None	EXPLOSIVES 1.1*
	Cord, detonating, mild effect *or* **Fuse, detonating, mild effect** *metal clad*	1.4D	UN0104	II	1.4D		None	62	None	EXPLOSIVES 1.4
	Cord, igniter	1.4G	UN0066	II	1.4G		None	62	None	EXPLOSIVES 1.4
	Cordeau detonant fuse, see **Cord, detonating,** *etc.*; **Cord, detonating,** *flexible*									
	Cordite, see **Powder, smokeless**									
G	**Corrosive liquid, acidic, inorganic, n.o.s.**	8	UN3264	I	8	B10, T14, TP2, TP27	None	201	243	CORROSIVE
				II	8	B2, IB2, T11, TP2, TP27	154	202	242	CORROSIVE
				III	8	IB3, T7, TP1, TP28	154	203	241	CORROSIVE
G	**Corrosive liquid, acidic, organic, n.o.s.**	8	UN3265	I	8	B10, T14, TP2, TP27	None	201	243	CORROSIVE
				II	8	B2, IB2, T11, TP2, TP27	154	202	242	CORROSIVE
				III	8	IB3, T7, TP1, TP28	154	203	241	CORROSIVE
G	**Corrosive liquid, basic, inorganic, n.o.s.**	8	UN3266	I	8	B10, T14, TP2, TP27	None	201	243	CORROSIVE
				II	8	B2, IB2, T11, TP2, TP27	154	202	242	CORROSIVE
				III	8	IB3, T7, TP1, TP28	154	203	241	CORROSIVE
G	**Corrosive liquid, basic, organic, n.o.s.**	8	UN3267	I	8	B10, T14, TP2, TP27	None	201	243	CORROSIVE
				II	8	B2, IB2, T11, TP2, TP27	154	202	242	CORROSIVE
				III	8	IB3, T7, TP1, TP28	154	203	241	CORROSIVE
G	**Corrosive liquid, self-heating, n.o.s.**	8	UN3301	I	8, 4.2	B10	None	201	243	CORROSIVE
				II	8, 4.2	B2, IB1	154	202	242	CORROSIVE
G	**Corrosive liquids, flammable, n.o.s.**	8	UN2920	I	8, 3	B10, T14, TP2, TP27	None	201	243	CORROSIVE
				II	8, 3	B2, IB2, T11, TP2, TP27	None	202	243	CORROSIVE
G	**Corrosive liquids, n.o.s.**	8	UN1760	I	8	A7, B10, T14, TP2, TP27	None	201	243	CORROSIVE
				II	8	B2, IB2, T11, TP2, TP27	154	202	242	CORROSIVE
				III	8	IB3, T7, TP1, TP28	154	203	241	CORROSIVE
G	**Corrosive liquids, oxidizing, n.o.s.**	8	UN3093	I	8, 5.1		None	201	243	CORROSIVE
				II	8, 5.1	IB2	None	202	243	CORROSIVE
G	**Corrosive liquids, toxic, n.o.s.**	8	UN2922	I	8, 6.1	A7, B10, T14, TP2, TP13, TP27	None	201	243	CORROSIVE
				II	8, 6.1	B3, IB2, T7, TP2	None	202	243	CORROSIVE
				III	8, 6.1	IB3, T7, TP1, TP28	154	203	241	CORROSIVE
G	**Corrosive liquids, water-reactive, n.o.s.**	8	UN3094	I	8, 4.3		None	201	243	CORROSIVE, DANGEROUS WHEN WET*
				II	8, 4.3		None	202	243	CORROSIVE, DANGEROUS WHEN WET*
G	**Corrosive solid, acidic, inorganic, n.o.s.**	8	UN3260	I	8	IB7, IP1	None	211	242	CORROSIVE
				II	8	IB8, IP2, IP4	154	212	240	CORROSIVE
				III	8	IB8, IP3	154	213	240	CORROSIVE
G	**Corrosive solid, acidic, organic, n.o.s.**	8	UN3261	I	8	IB7, IP1	None	211	242	CORROSIVE
				II	8	IB8, IP2, IP4	154	212	240	CORROSIVE
				III	8	IB8, IP3	154	213	240	CORROSIVE
G	**Corrosive solid, basic, inorganic, n.o.s.**	8	UN3262	I	8	IB7, IP1	None	211	242	CORROSIVE
				II	8	IB8, IP2, IP4	154	212	240	CORROSIVE

HAZARDOUS MATERIALS TABLE

Symbols	Hazardous materials descriptions and proper shipping names	Hazard class or Division	Identification Numbers	PG	Label Codes	Special provisions (§172.102)	(8) Packaging (§173.***)			Placards Consult regulations for specifics (Part 172, Subpart F) *Denotes placard for any quantity
							Exceptions	Non-bulk	Bulk	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8A)	(8B)	(8C)	
G	**Toxic solids, corrosive, organic, n.o.s.**	6.1	UN2928	I	6.1, 8	IB7	None	211	242	POISON
				II	6.1, 8	IB6, IP2	None	212	242	POISON
G	**Toxic solids, flammable, organic, n.o.s.**	6.1	UN2930	I	6.1, 4.1	IB6	None	211	242	POISON
				II	6.1, 4.1	IB8, IP2, IP4	None	212	242	POISON
G	**Toxic solids, organic, n.o.s.**	6.1	UN2811	I	6.1	IB7	None	211	242	POISON
				II	6.1	IB8, IP2, IP4	None	212	242	POISON
				III	6.1	IB8, IP3	153	213	240	POISON
G	**Toxic solids, oxidizing, n.o.s.**	6.1	UN3086	I	6.1, 5.1		None	211	242	POISON
				II	6.1, 5.1	IB6, IP2	None	212	242	POISON
G	**Toxic solids, self-heating, n.o.s.**	6.1	UN3124	I	6.1, 4.2	A5	None	211	242	POISON
				II	6.1, 4.2	IB6, IP2	None	212	242	POISON
G	**Toxic solids, water-reactive, n.o.s.**	6.1	UN3125	I	6.1, 4.3	A5	None	211	242	POISON, DANGEROUS WHEN WET*
				II	6.1, 4.3	IB6, IP2	None	212	242	POISON, DANGEROUS WHEN WET*
D	**Toy Caps**	1.4S	NA0337	II	1.4S		None	62	None	EXPLOSIVES 1.4
	Tracers for ammunition	1.3G	UN0212	II	1.3G		None	62	None	EXPLOSIVES 1.3*
	Tracers for ammunition	1.4G	UN0306	II	1.4G		None	62	None	EXPLOSIVES 1.4
	Tractors, see **Vehicle,** *etc.*									
	Tri-(b-nitroxyethyl) ammonium nitrate	Forbidden								
	Triallyl borate	6.1	UN2609	III	6.1	IB3	153	203	241	POISON
	Triallylamine	3	UN2610	III	3, 8	B1, IB3, T4, TP1	None	203	242	FLAMMABLE
	Triazine pesticides, liquid, flammable, toxic, *flash point less than 23 degrees C*	3	UN2764	I	3, 6.1	T14, TP2, TP13, TP27	None	201	243	FLAMMABLE
				II	3, 6.1	IB2, T11, TP2, TP13, TP27	None	202	243	FLAMMABLE
	Triazine pesticides, liquid, toxic	6.1	UN2998	I	6.1	T14, TP2, TP13, TP27	None	201	243	POISON
				II	6.1	IB2, T11, TP2, TP13, TP27	None	202	243	POISON
				III	6.1	IB3, T7, TP2, TP28	153	203	241	POISON
	Triazine pesticides, liquid, toxic, flammable, *flashpoint not less than 23 degrees C*	6.1	UN2997	I	6.1, 3	T14, TP2, TP13, TP27	None	201	243	POISON
				II	6.1, 3	IB2, T11, TP2, TP13, TP27	None	202	243	POISON
				III	6.1, 3	IB3, T7, TP2, TP28	153	203	242	POISON
	Triazine pesticides, solid, toxic	6.1	UN2763	I	6.1	IB7, IP1	None	211	242	POISON
				II	6.1	IB8, IP2, IP4	None	212	242	POISON
				III	6.1	IB8, IP3	153	213	240	POISON
	Tributylamine	6.1	UN2542	II	6.1	IB2, T7, TP2	None	202	243	POISON
	Tributylphosphane	4.2	UN3254	I	4.2		None	211	242	SPONTANEOUSLY COMBUSTIBLE
	Trichloro-s-triazinetrione dry, with more than 39 percent available chlorine, see **Trichloroisocyanuric acid, dry**									
	Trichloroacetic acid	8	UN1839	II	8	A7, IB8, IP2, IP4, N34	154	212	240	CORROSIVE
	Trichloroacetic acid, solution	8	UN2564	II	8	A3, A6, A7, B2, IB2, N34, T7, TP2	154	202	242	CORROSIVE
				III	8	A3, A6, A7, IB3, N34, T4, TP1	154	203	241	CORROSIVE
+	**Trichloroacetyl chloride**	8	UN2442	II	8, 6.1	2, A3, A7, B9, B14, B32, B74, N34, T20, TP2, TP38, TP45	None	227	244	CORROSIVE, POISON INHALATION HAZARD*
	Trichlorobenzenes, liquid	6.1	UN2321	III	6.1	IB3, T4, TP1	153	203	241	POISON
	Trichlorobutene	6.1	UN2322	II	6.1	IB2, T7, TP2	None	202	243	POISON
	1,1,1-Trichloroethane	6.1	UN2831	III	6.1	IB3, N36, T4, TP1	153	203	241	POISON
	Trichloroethylene	6.1	UN1710	III	6.1	IB3, N36, T4, TP1	153	203	241	POISON
	Trichloroisocyanuric acid, dry	5.1	UN2468	II	5.1	IB8, IP4	152	212	240	OXIDIZER
	Trichloromethyl perchlorate	Forbidden								

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Symbols	Hazardous materials descriptions and proper shipping names	Hazard class or Division	Identification Numbers	PG	Label Codes	Special provisions (§172.102)	(8) Packaging (§173.***)			Placards Consult regulations for specifics (Part 172, Subpart F) *Denotes placard for any quantity
							Exceptions	Non-bulk	Bulk	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8A)	(8B)	(8C)	
	Dichloroisocyanuric acid, dry *or* **Dichloroisocyanuric acid salts**	5.1	UN2465	II	5.1	28, IB8, IP4	152	212	240	OXIDIZER
	Dichloroisopropyl ether	6.1	UN2490	II	6.1	IB2, T7, TP2	None	202	243	POISON
	Dichloromethane	6.1	UN1593	III	6.1	IB3, IP8, N36, T7, TP2	153	203	241	POISON
	Dichloropentanes	3	UN1152	III	3	B1, IB3, T2, TP1	150	203	242	FLAMMABLE
	Dichlorophenyl isocyanates	6.1	UN2250	II	6.1	IB8, IP2, IP4, T7, TP2	None	212	242	POISON
	Dichlorophenyltrichlorosilane	8	UN1766	II	8	A7, B2, B6, IB2, N34, T7, TP2, TP13	None	202	242	CORROSIVE
	1,2-Dichloropropane	3	UN1279	II	3	IB2, N36, T4, TP1	150	202	242	FLAMMABLE
	1,3-Dichloropropanol-2	6.1	UN2750	II	6.1	IB2, T7, TP2	None	202	243	POISON
	Dichloropropene and propylene dichloride mixture, see **1,2-Dichloropropane**									
	Dichloropropenes	3	UN2047	II	3	IB2, T4, TP1	150	202	242	FLAMMABLE
				III	3	B1, IB3, T2, TP1	150	203	242	FLAMMABLE
	Dichlorosilane	2.3	UN2189		2.3, 2.1, 8	2, B9, B14	None	304	314, 315	POISON GAS*
	1,2-Dichloro-1,1,2,2-tetrafluoroethane *or* **Refrigerant gas R 114**	2.2	UN1958		2.2	T50	306	304	314, 315	NONFLAMMABLE GAS
	Dichlorovinylchloroarsine	Forbidden								
	Dicycloheptadiene, see **Bicyclo [2,2,1] hepta-2, 5-diene, inhabited**									
	Dicyclohexylamine	8	UN2565	III	8	IB3, T4, TP1	154	203	241	CORROSIVE
	Dicyclohexylammonium nitrite	4.1	UN2687	III	4.1	IB8, IP3	151	213	240	FLAMMABLE SOLID
	Dicyclopentadiene	3	UN2048	III	3	B1, IB3, T2, TP1	150	203	242	FLAMMABLE
	Didymium nitrate	5.1	UN1465	III	5.1	A1, IB8, IP3	152	213	240	OXIDIZER
D	**Diesel fuel**	3	NA1993	III	None	B1, IB3, T4, TP1, TP29	150	203	242	COMBUSTIBLE (BULK ONLY)
I	**Diesel fuel**	3	UN1202	III	3	B1, IB3, T2, TP1	150	203	242	FLAMMABLE
	Diethanol nitrosamine dinitrate (dry)	Forbidden								
	Diethoxymethane	3	UN2373	II	3	IB2, T4, TP1	150	202	242	FLAMMABLE
	3,3-Diethoxypropene	3	UN2374	II	3	IB2, T4, TP1	150	202	242	FLAMMABLE
	Diethyl carbonate	3	UN2366	III	3	B1, IB3, T2, TP1	150	203	242	FLAMMABLE
	Diethyl cellosolve, see **Ethylene glycol diethyl ether**									
	Diethyl ether *or* **Ethyl ether**	3	UN1155	I	3	T11, TP2	150	201	243	FLAMMABLE
	Diethyl ketone	3	UN1156	II	3	IB2, T4, TP1	150	202	242	FLAMMABLE
	Diethyl peroxydicarbonate, with more than 27 percent in solution	Forbidden								
	Diethyl sulfate	6.1	UN1594	II	6.1	IB2, T7, TP2	None	202	243	POISON
	Diethyl sulfide	3	UN2375	II	3	IB2, T7, TP1, TP13	None	202	243	FLAMMABLE
	Diethylamine	3	UN1154	II	3, 8	IB2, N34, T7, TP1	None	202	243	FLAMMABLE
	2-Diethylaminoethanol	8	UN2686	II	8, 3	B2, IB2, T7, TP2	None	202	243	CORROSIVE
	Diethylaminopropylamine	3	UN2684	III	3, 8	B1, IB3, T4, TP1	150	203	242	FLAMMABLE
+	**N,N-Diethylaniline**	6.1	UN2432	III	6.1	IB3, T4, TP1	153	203	241	POISON
	Diethylbenzene	3	UN2049	III	3	B1, IB3, T2, TP1	150	203	242	FLAMMABLE
	Diethyldichlorosilane	8	UN1767	II	8, 3	A7, B6, IB2, N34, T7, TP2, TP13	None	202	243	CORROSIVE
	Diethylene glycol dinitrate	Forbidden								
	Diethyleneglycol dinitrate, desensitized *with not less than 25 percent non-volatile water-insoluble phlegmatizer, by mass*	1.1D	UN0075	II	1.1D		None	62	None	EXPLOSIVES 1.1*
	Diethylenetriamine	8	UN2079	II	8	B2, IB2, T7, TP2	154	202	242	CORROSIVE
	N,N-Diethylethylenediamine	8	UN2685	II	8, 3	IB2, T7, TP2	None	202	243	CORROSIVE
	Diethylgold bromide	Forbidden								
	Diethylthiophosphoryl chloride	8	UN2751	II	8	B2, IB2, T7, TP2	154	202	242	CORROSIVE
	Diethylzinc	4.2	UN1366	I	4.2, 4.3	B11, T21, TP2, TP7	None	181	244	SPONTANEOUSLY COMBUSTIBLE, DANGEROUS WHEN WET*
	Difluorochloroethanes, see **1-Chloro-1, 1-difluoroethanes**									
	1,1-Difluoroethane *or* **Refrigerant gas R 152a**	2.1	UN1030		2.1	T50	306	304	314, 315	FLAMMABLE GAS
	1,1-Difluoroethylene *or* **Refrigerant gas R 1132a**	2.1	UN1959		2.1		306	304	None	FLAMMABLE GAS

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							Exceptions	Non-bulk	Bulk	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8A)	(8B)	(8C)	
+	**Sulfuric acid,** *fuming with 30 percent or more free sulfur trioxide*	8	UN1831	I	8, 6.1	2, A3, A6, A7, B9, B14, B32, B74, B77, B84, N34, T20, TP2, TP12, TP13	None	227	244	CORROSIVE, POISON INHALATION HAZARD*
	Sulfuric acid, spent	8	UN1832	II	8	A3, A7, B2, B83, B84, IB2, N34, T8, TP2, TP12	None	202	242	CORROSIVE
	Sulfuric acid *with more than 51 percent acid*	8	UN1830	II	8	A3, A7, B3, B83, B84, IB2, N34, T8, TP2, TP12	154	202	242	CORROSIVE
	Sulfuric acid *with not more than 51% acid*	8	UN2796	II	8	A3, A7, B2, B15, IB2, N6, N34, T8, TP2, TP12	154	202	242	CORROSIVE
	Sulfuric and hydrofluoric acid mixtures, *see* **Hydrofluoric and sulfuric acid mixtures**									
	Sulfuric anhydride, see **Sulfur trioxide**									
	Sulfurous acid	8	UN1833	II	8	B3, IB2, T7, TP2	154	202	242	CORROSIVE
+	**Sulfuryl chloride**	8	UN1834	I	8, 6.1	1, A3, B6, B9, B10, B14, B30, B74, B77, N34, T22, TP2, TP12, TP38, TP44	None	226	244	CORROSIVE, POISON INHALATION HAZARD*
	Sulfuryl fluoride	2.3	UN2191		2.3	4	None	304	314, 315	POISON GAS*
	Tars, liquid *including road asphalt and oils, bitumen and cut backs*	3	UN1999	II	3	B13, IB2, T3, TP3, TP29	150	202	242	FLAMMABLE
				III	3	B1, B13, IB3, T1, TP3	150	203	242	FLAMMABLE
	Tear gas candles	6.1	UN1700	II	6.1, 4.1		None	340	None	POISON
	Tear gas cartridges, see **Ammunition, tear-producing, etc.**									
D	**Tear gas devices** *with more than 2 percent tear gas substances, by mass*	6.1	NA1693	I	6.1		None	340	None	POISON
				II	6.1		None	340	None	POISON
	Tear gas devices, with not more than 2 percent tear gas substances, by mass, see **Aerosols,** *etc.*									
	Tear gas grenades, see **Tear gas candles**									
G	**Tear gas substances, liquid, n.o.s.**	6.1	UN1693	I	6.1		None	201	None	POISON
				II	6.1	IB2	None	202	None	POISON
G	**Tear gas substances, solid, n.o.s.**	6.1	UN1693	I	6.1		None	211	None	POISON
				II	6.1	IB8, IP2, IP4	None	212	None	POISON
	Tellurium compound, n.o.s.	6.1	UN3284	I	6.1	IB7, IP1, T14, TP2, TP27	None	211	242	POISON
				II	6.1	IB8, IP2, IP4, T11, TP2, TP27	None	212	242	POISON
				III	6.1	IB8, IP3, T7, TP1, TP28	153	213	240	POISON
	Tellurium hexafluoride	2.3	UN2195		2.3, 8	1	None	302	None	POISON GAS*
	Terpene hydrocarbons, n.o.s.	3	UN2319	III	3	B1, IB3, T4, TP1, TP29	150	203	242	FLAMMABLE
	Terpinolene	3	UN2541	III	3	B1, IB3, T2, TP1	150	203	242	FLAMMABLE
	Tetraazido benzene quinone	Forbidden								
	Tetrabromoethane	6.1	UN2504	III	6.1	IB3, T4, TP1	153	203	241	POISON
	Tetrachloroethane	6.1	UN1702	II	6.1	IB2, N36, T7, TP2	None	202	243	POISON
	Tetrachloroethylene	6.1	UN1897	III	6.1	IB3, N36, T4, TP1	153	203	241	POISON
	Tetraethyl dithiopyrophosphate	6.1	UN1704	II	6.1	IB8, IP2, IP4	None	212	242	POISON
	Tetraethyl silicate	3	UN1292	III	3	B1, IB3, T2, TP1	150	203	242	FLAMMABLE
	Tetraethylammonium perchlorate (dry)	Forbidden								
	Tetraethylenepentamine	8	UN2320	III	8	IB3, T4, TP1	154	203	241	CORROSIVE
	1,1,1,2-Tetrafluoroethane *or* **Refrigerant gas R 134a**	2.2	UN3159		2.2	T50	306	304	314, 315	NONFLAMMABLE GAS
	Tetrafluoroethylene, stabilized	2.1	UN1081		2.1		306	304	None	FLAMMABLE GAS
	Tetrafluoromethane, compressed *or* **Refrigerant gas R 14**	2.2	UN1982		2.2		None	302	None	NONFLAMMABLE GAS
	1,2,3,6-Tetrahydrobenzaldehyde	3	UN2498	III	3	B1, IB3, T2, TP1	150	203	242	FLAMMABLE
	Tetrahydrofuran	3	UN2056	II	3	IB2, T4, TP1	None	202	242	FLAMMABLE
	Tetrahydrofurfurylamine	3	UN2943	III	3	B1, IB3, T2, TP1	150	203	242	FLAMMABLE
	Tetrahydrophthalic anhydrides *with more than 0.05 percent of maleic anhydride*	8	UN2698	III	8	IB8, IP3	154	213	240	CORROSIVE

(4) **Wax "Vesta" matches** are matches that can be ignited by friction either on a prepared surface or on a solid surface.

(c) Safety matches and wax "Vesta" matches must be tightly packed in securely closed inner packagings to prevent accidental ignition under conditions normally incident to transportation, and further packed in outer fiberboard, wooden, or other equivalent-type packagings. These matches in outer packagings not exceeding 23 kg (50 pounds) gross weight are not subject to any other requirement (except marking) of this subchapter. These matches may be packed in the same outer packaging with materials not subject to this subchapter.

(d) Strike-anywhere matches may not be packed in the same outer packaging with any material other than safety matches or wax "Vesta" matches, which must be packed in separate inner packagings.

(e) *Packagings.* Strike-anywhere matches must be tightly packed in securely closed chipboard, fiberboard, wooden, or metal inner packagings to prevent accidental ignition under conditions normally incident to transportation. Each inner packaging may contain no more than 700 strike-anywhere matches and must be packed in outer steel drums (1A2), aluminum drums (1B2), steel jerricans (3A2), wooden (4C1, 4C2), plywood (4D), reconstituted wood (4F) or fiberboard (4G) boxes, plywood (1D) or fiber (1G) drums. Gross weight of fiberboard boxes (4G) must not exceed 27 kg (60 pounds). Gross weight of other outer packagings must not exceed 45 kg (100 pounds).

§173.201 Non-bulk packagings for liquid hazardous materials in Packing Group I.

(a) When §172.101 of this subchapter specifies that a liquid hazardous material be packaged under this section, only non-bulk packagings prescribed in this section may be used for its transportation. Each packaging must conform to the general packaging requirements of subpart B of part 173, to the requirements of part 178 of this subchapter at the Packing Group I performance level, and to the requirements of the special provisions of Column 7 of the §172.101 Table.

(b) The following combination packagings are authorized:

Outer packagings:

Steel drum: 1A1 or 1A2
Aluminum drum: 1B1 or 1B2
Metal drum other than steel or aluminum: 1N1 or 1N2
Plywood drum: 1D
Fiber drum: 1G
Plastic drum: 1H1 or 1H2
Steel jerrican: 3A1 or 3A2
Plastic jerrican: 3H1 or 3H2
Aluminum jerrican: 3B1 or 3B2
Steel box: 4A
Aluminum box: 4B
Natural wood box: 4C1 or 4C2
Plywood box: 4D
Reconstituted wood box: 4F
Fiberboard box: 4G
Expanded plastic box: 4H1
Solid plastic box: 4H2

Inner packagings:

Glass or earthenware receptacles
Plastic receptacles
Metal receptacles
Glass ampoules

(c) Except for transportation by passenger aircraft, the following single packagings are authorized:

Steel drum: 1A1 or 1A2
Aluminum drum: 1B1 or 1B2
Metal drum other than steel, or aluminum: 1N1 or 1N2
Plastic drum: 1H1 or 1H2
Steel jerrican: 3A1 or 3A2
Plastic jerrican: 3H1 or 3H2
Aluminum jerrican: 3B1 or 3B2
Plastic receptacle in steel, aluminum, fiber or plastic drum: 6HA1, 6HB1, 6HG1, 6HH1
Plastic receptacle in steel, aluminum, wooden, plywood or fiberboard box: 6HA2, 6HB2, 6HC, 6HD2 or 6HG2
Glass, porcelain or stoneware in steel, aluminum or fiber drum: 6PA1, 6PB1 or 6PG1
Glass, porcelain or stoneware in steel, aluminum, wooden or fiberboard box: 6PA2, 6PB2, 6PC or 6PG2
Glass, porcelain or stoneware in solid or expanded plastic packaging: 6PH1 or 6PH2
Cylinders, specification, as prescribed for any compressed gas, except for Specifications 8 and 3HT

§173.202 Non-bulk packagings for liquid hazardous materials in Packing Group II.

(a) When §172.101 of this subchapter specifies that a liquid hazardous material be packaged under this section, only non-bulk packagings prescribed in this section may be used for its transportation. Each packaging must conform to the general packaging requirements of subpart B of part 173, to the requirements of part 178 of this subchapter at the Packing Group I or II performance level (unless otherwise excepted), and to the particular requirements of the special provisions of Column 7 of the §172.101 Table.

(b) The following combination packagings are authorized:

Outer packagings:

Steel drum: 1A1 or 1A2
Aluminum drum: 1B1 or 1B2
Metal drum other than steel or aluminum: 1N1 or 1N2
Plywood drum: 1D
Fiber drum: 1G
Plastic drum: 1H1 or 1H2
Wooden barrel: 2C2
Steel jerrican: 3A1 or 3A2
Plastic jerrican: 3H1 or 3H2
Aluminum jerrican: 3B1 or 3B2

Steel box: 4A
Aluminum box: 4B
Natural wood box: 4C1 or 4C2
Plywood box: 4D
Reconstituted wood box: 4F
Fiberboard box: 4G
Expanded plastic box: 4H1
Solid plastic box: 4H2

Inner packagings:

Glass or earthenware receptacles
Plastic receptacles
Metal receptacles
Glass ampoules

(c) Except for transportation by passenger aircraft, the following single packagings are authorized:

Steel drum: 1A1 or 1A2
Aluminum drum: 1B1 or 1B2
Metal drum other than steel or aluminum: 1N1 or 1N2
Plastic drum: 1H1 or 1H2
Fiber drum: 1G (with liner)
Wooden barrel: 2C1
Steel jerrican: 3A1 or 3A2
Plastic jerrican: 3H1 or 3H2
Aluminum jerrican: 3B1 or 3B2
Plastic receptacle in steel, aluminum, fiber or plastic drum: 6HA1, 6HB1, 6HG1 or 6HH1
Plastic receptacle in steel, aluminum, wooden, plywood or fiberboard box: 6HA2, 6HB2, 6HC, 6HD2 or 6HG2
Glass, porcelain or stoneware in steel, aluminum or fiber drum: 6PA1, 6PB1 or 6PG1
Glass, porcelain or stoneware in steel, aluminum, wooden or fiberboard box: 6PA2, 6PB2, 6PC or 6PG2
Glass, porcelain or stoneware in solid or expanded plastic packaging: 6PH1 or 6PH2
Plastic receptacle in plywood drum: 6HD1
Glass, porcelain or stoneware in plywood drum or wickerwork hamper: 6PD1 or 6PD2
Cylinders, specification, as prescribed for any compressed gas, except for Specifications 8 and 3HT

§173.203 Non-bulk packagings for liquid hazardous materials in Packing Group III.

(a) When §172.101 of this subchapter specifies that a liquid hazardous material be packaged under this section, only non-bulk packagings prescribed in this section may be used for its transportation. Each packaging must conform to the general packaging requirements of subpart B of part 173, to the requirements of part 178 of this subchapter at the Packing Group I, II or III performance level, and to the requirements of the special provisions of Column 7 of the §172.101 Table.

(b) The following combination packagings are authorized:

Outer packagings:

Steel drum: 1A1 or 1A2
Aluminum drum: 1B1 or 1B2
Metal drum other than steel or aluminum: 1N1 or 1N2
Plywood drum: 1D
Fiber drum: 1G
Plastic drum: 1H1 or 1H2
Wooden barrel: 2C2
Steel jerrican: 3A1 or 3A2
Plastic jerrican: 3H1 or 3H2
Aluminum jerrican: 3B1 or 3B2
Steel box: 4A
Aluminum box: 4B
Natural wood box: 4C1 or 4C2
Plywood box: 4D
Reconstituted wood box: 4F
Fiberboard box: 4G
Expanded plastic box: 4H1
Solid plastic box: 4H2

Inner packagings:

Glass or earthenware receptacles
Plastic receptacles
Metal receptacles
Glass ampoules

(c) The following single packagings are authorized:

Steel drum: 1A1 or 1A2
Aluminum drum: 1B1 or 1B2
Metal drum other than steel or aluminum: 1N1
Plastic drum: 1H1 or 1H2
Fiber drum: 1G (with liner)
Wooden barrel: 2C1
Steel jerrican: 3A1 or 3A2
Plastic jerrican: 3H1 or 3H2
Aluminum jerrican: 3B1 or 3B2
Plastic receptacle in steel, aluminum, fiber or plastic drum: 6HA1, 6HB1, 6HG1 or 6HH1
Plastic receptacle in steel, aluminum, wooden, plywood or fiberboard box: 6HA2, 6HB2, 6HC, 6HD2 or 6HG2
Glass, porcelain or stoneware in steel, aluminum or fiber drum: 6PA1, 6PB1, or 6PG1
Glass, porcelain or stoneware in steel, aluminum, wooden or fiberboard box: 6PA2, 6PB2, 6PC or 6PG2
Glass, porcelain or stoneware in solid or expanded plastic packaging: 6PH1 or 6PH2
Plastic receptacle in plywood drum: 6HD1
Glass, porcelain or stoneware in plywood drum or wickerwork hamper: 6PD1 or 6PD2
Cylinders, as prescribed for any compressed gas, except for Specifications 8 and 3HT

§173.204 Non-bulk, non-specification packagings for certain hazardous materials.

When §172.101 of this subchapter specifies that a liquid or solid hazardous material be packaged under this section, any appropriate non-bulk packaging which conforms to the general packaging requirements of subpart B of part 173 may be used for its transportation. Packagings need not conform to the requirements of part 178 of this subchapter.

DOT 407, and DOT 412 cargo tank motor vehicles; non-DOT specification, sift-proof cargo tank motor vehicles; and sift-proof closed vehicles.

(c) *Portable tanks and closed bulk bins.* DOT 51, 56, 57 and 60 portable tanks; IMO type 1, 2 and 5, and IM 101 and IM 102 portable tanks; UN portable tanks; marine portable tanks conforming to 46 CFR part 64; and sift-proof non-DOT Specification portable tanks and closed bulk bins are authorized.

(d) *IBCs.* IBCs are authorized subject to the conditions and limitations of this section provided the IBC type is authorized according to the IBC packaging code specified for the specific hazarous material in Column (7) of the §172.101 Table of this subchapter and the IBC conforms to the requirements in subpart O of part 178 of this subchapter at the Packing Group performance level as specified in Column (5) of the §172.101 Table of this subchapter for the material being transported.

(1) IBCs may not be used for the following hazardous materials:

(i) Packing Group I liquids; and

(ii) Packing Group I solids that may become liquid during transportation.

(2) The following IBCs may not be used for Packing Group II and III solids that may become liquid during transportation:

(i) Wooden: 11C, 11D and 11F;

(ii) Fiberboard: 11G;

(iii) Flexible: 13H1, 13H2, 13H3, 13H4, 13H5, 13L1, 13L2, 13L3, 13L4, 13M1 and 13M2; and

(iv) Composite: 11HZ2 and 21HZ2.

§173.241 Bulk packagings for certain low hazard liquid and solid materials.

When §172.101 of this subchapter specifies that a hazardous material be packaged under this section, only the following bulk packagings are authorized, subject to the requirements of subparts A and B of part 173 of this subchapter and the special provisions specified in Column 7 of the §172.101 Table.

(a) *Rail cars:* Class DOT 103, 104, 105, 109, 111, 112, 114, 115, or 120 tank car tanks; Class 106 or 110 multi-unit tank car tanks and AAR Class 203W, 206W, and 211W tank car tanks.

(b) *Cargo tanks:* DOT specification MC 300, MC 301, MC 302, MC 303, MC 304, MC 305, MC 306, MC 307, MC 310, MC 311, MC 312, MC 330, MC 331, DOT 406, DOT 407, and DOT 412 cargo tank motor vehicles; and non-DOT specification cargo tank motor vehicles suitable for transport of liquids.

(c) *Portable tanks.* DOT Specification 51, 56, 57 and 60 portable tanks; IMO type 1, 2 and 5, and IM 101 and IM 102 portable tanks; UN portable tanks; marine portable tanks conforming to 46 CFR part 64; and non-DOT Specification portable tanks suitable for transport of liquids are authorized.

(d) *IBCs.* IBCs are authorized subject to the conditions and limitations of this section provided the IBC type is authorized according to the IBC packaging code specified for the specific hazardous material in Column (7) of the §172.101 Table of this subchapter and the IBC conforms to the requirements in subpart O of part 178 of this subchapter at the Packing Group performance level as specified in Column (5) of the §172.101 Table for the material being transported.

(1) IBCs may not be used for the following hazardous materials:

(i) Packing Group I liquids; and

(ii) Packing Group I solids that may become liquid during transportation.

(2) The following IBCs may not be used for Packing Group II and III solids that may become liquid during transportation:

(i) Wooden: 11C, 11D and 11F;

(ii) Fiberboard: 11G;

(iii) Flexible: 13H1, 13H2, 13H3, 13H4, 13H5, 13L1, 13L2, 13L3, 13L4, 13M1 and 13M2; and

(iv) Composite: 11HZ2 and 21HZ2.

§173.242 Bulk packagings for certain medium hazard liquids and solids, including solids with dual hazards.

When §172.101 of this subchapter specifies that a hazardous material be packaged under this section, only the following bulk packagings are authorized, subject to the requirements of subparts A and B of part 173 of this subchapter and the special provisions specified in Column 7 of the 172.101 Table.

(a) *Rail cars:* Class DOT 103, 104, 105, 109, 111, 112, 114, 115, or 120 tank car tanks; Class 106 or 110 multi-unit tank car tanks and AAR Class 206W tank car tanks

(b) *Cargo tanks:* Specification MC 300, MC 301, MC 302, MC 303, MC 304, MC 305, MC 306, MC 307, MC 310, MC 311, MC 312, MC 330, MC 331, DOT 406, DOT 407, and DOT 412 cargo tank motor vehicles. Cargo tanks used to transport Class 3, Packing Group I or II, or Packing Group III with a flash point of less than 38°C (100°F); Class 6, Packing Group I or II; and Class 8, Packing Group I or II materials must conform to the following special requirements:

(1) Pressure relief system: Except as provided by §173.33(d), each cargo tank must be equipped with a pressure relief system meeting the requirements of §178.346-3 or §178.347-4 of this subchapter. However, pressure relief devices on MC 310, MC 311 and MC 312 cargo tanks must meet the requirements for a Specification MC 307 cargo tank (except for Class 8, Packing Group I and II). Pressure relief devices on

MC 330 and MC 331 cargo tanks must meet the requirement in §178.337-9 of this subchapter.

(2) Bottom outlets: DOT 406, DOT 407 and DOT 412 must be equipped with stop-valves meeting the requirements of §178.345-11 of this subchapter; MC 304, MC 307, MC 310, MC 311, and MC 312 cargo tanks must be equipped with stop-valves capable of being remotely closed within 30 seconds of actuation by manual or mechanic means and (except for Class 8, Packing Group I and II) by a closure activated at a temperature not over 121°C (250°F); MC 330 and MC 331 cargo tanks must be equipped with internal self-closing stop-valves meeting the requirements in §178.337-11 of this subchapter.

(c) *Portable tanks:* DOT Specification 51, 56, 57 and 60 portable tanks; Specification IM and UN portable tanks when a T Code is specified in Column (7) of the §172.101 Hazardous Materials Table for a specific hazardous material; and marine portable tanks conforming to 46 CFR part 64 are authorized. DOT Specification 57 portable tanks used for the transport by vessel of Class 3, Packaging Group II materials must conform to the following:

(1) *Minimum design pressure.* Each tank must have a minimum design pressure of 62 kPa (9 psig);

(2) *Pressure relief devices.* Each tank must be equipped with at least one pressure relief device, such as a spring-loaded valve or fusible plug, conforming to the following:

(i) Each pressure relief device must communicate with the vapor space of the tank when the tank is in a normal transportation attitude. Shutoff valves may not be installed between the tank opening and any pressure relief device. Pressure relief devices must be mounted, shielded, or drained to prevent the accumulation of any material that could impair the operation or discharge capability of the device;

(ii) Frangible devices are not authorized;

(iii) No pressure relief device may open at less than 34.4 kPa (5 psig);

(iv) If a fusible device is used for relieving pressure, the device must have a minimum area of 1.25 square inches. The device must function at a temperature between 104°C. and 149°C. (200°F. and 300°F.) and at a pressure less than the design test pressure of the tank, unless this latter function is accomplished by a separate device; and

(v) No relief device may be used which would release flammable vapors under normal conditions of transportation (temperature up to and including 54°C. (130°F.).); and

(3) *Venting capacity.* The minimum venting capacity for pressure activated vents must be 6,000 cubic feet of free air per hour (measured at 101.3 kPa (14.7 psi) and 15.6°C. (60°F.)) at not more than 34.4 kPa (5 psi). The total emergency venting capacity (cu. ft./hr.) of each portable tank must be at least that determined from the following table:

Total surface area square feet [1] [2]	Cubic feet free air per hour
20	15,800
30	23,700
40	31,600
50	39,500
60	47,400
70	55,300
80	63,300
90	71,200
100	79,100
120	94,900
140	110,700
160	126,500

[1] Interpolate for intermediate sizes.
[2] Surface area excludes area of legs.

(d) *IBCs.* IBCs are authorized subject to the conditions and limitations of this section provided the IBC type is authorized according to the IBC packaging code specified for the specific hazardous material in Column (7) of the §172.101 Table of this subchapter and the IBC conforms to the requirements in subpart O of part 178 of this subchapter at the Packing Group performance level as specified in Column (5) of the §172.101 Table of this subchapter for the material being transported.

(1) IBCs may not be used for the following hazardous materials:

(i) Packing Group I liquids; and

(ii) Packing Group I solids that may become liquid during transportation.

(2) The following IBCs may not be used for Packing Group II and III solids that may become liquid during transportation:

(i) Wooden: 11C, 11D and 11F;

(ii) Fiberboard: 11G;

(iii) Flexible: 13H1, 13H2, 13H3, 13H4, 13H5, 13L1, 13L2, 13L3, 13L4, 13M1 and 13M2; and

(iv) Composite: 11HZ2 and 21HZ2.

§173.243 Bulk packaging for certain high hazard liquids and dual hazard materials which pose a moderate hazard.

When §172.101 of this subchapter specifies that a hazardous material be packaged under this section, only the following bulk packagings are authorized, subject to the requirements of subparts A and B of part 173 of this subchapter and the special provisions specified in Column 7 of the §172.101 Table.

(a) *Rail cars:* Class DOT 103, 104, 105, 109, 111, 112, 114, 115, or 120 fusion-welded tank car tanks; and Class 106 or 110 multi-unit tank car tanks.

(b) *Cargo tanks.* Specification MC 304, MC 307, MC 330, MC 331 cargo tank motor vehicles; and MC 310, MC 311, MC 312, DOT 407, and DOT 412 cargo tank motor vehicles with tank design pressure of at least

172.4 kPa (25 psig). Cargo tanks used to transport Class 3 or Division 6.1 materials, or Class 8, Packing Group I or II materials must conform to the following special requirements:

(1) Pressure relief system: Except as provided by §173.33(d), each cargo tank must be equipped with a pressure relief system meeting the requirements of §178.346-3 or §178.347-4 of this subchapter. However, pressure relief devices on MC 310, MC 311 and MC 312 cargo tanks must meet the requirements for a Specification MC 307 cargo tank (except for Class 8, Packing Group I and II). Pressure relief devices on MC 330 and MC 331 cargo tanks must meet the requirement in §178.337-9 of this subchapter.

(2) Bottom outlets: DOT 407 and DOT 412 cargo tanks must be equipped with stop-valves meeting the requirements of §178.345-11 of this subchapter; MC 304, MC 307, MC 310, MC 311, and MC 312 cargo tanks must be equipped with stop-valves capable of being remotely closed within 30 seconds of actuation by manual or mechanic means and (except for Class 8, Packing Group I and II) by a closure activated at a temperature not over 121°C (250°F); MC 330 and MC 331 cargo tanks must be equipped with internal self-closing stop-valves meeting the requirements in §178.337-11 of this subchapter.

(c) *Portable tanks.* DOT Specification 51 and 60 portable tanks; UN portable tanks when a T code is specified in Column (7) of the §172.101 Table of this subchapter for a specific hazardous material; and marine portable tanks conforming to 46 CFR part 64 with design pressure of at least 172.4 kPa (25 psig) are authorized.

(d) *IBCs.* IBCs are authorized subject to the conditions and limitations of this section provided the IBC type is authorized according to the IBC packaging code specified for the specific hazardous material in Column (7) of the §172.101 Table of this subchapter and the IBC conforms to the requirements in subpart O of part 178 of this subchapter at the Packing Group performance level as specified in Column (5) of the §172.101 Table of this subchapter for the material being transported.

(1) IBCs may not be used for the following hazardous materials:

(i) Packing Group I liquids; and

(ii) Packing Group I solids that may become liquid during transportation.

(2) The following IBCs may not be used for Packing Group II and III solids that may become liquid during transportation:

(i) Wooden: 11C, 11D and 11F;

(ii) Fiberboard: 11G;

(iii) Flexible: 13H1, 13H2, 13H3, 13H4, 13H5, 13L1, 13L2, 13L3, 13L4, 13M1 and 13M2; and

(iv) Composite: 11HZ2 and 21HZ2.

§173.244 Bulk packaging for certain pyrophoric liquids (Division 4.2), dangerous when wet (Division 4.3) materials, and poisonous liquids with inhalation hazards (Division 6.1).

When §172.101 of this subchapter specifies that a hazardous material be packaged under this section, only the following bulk packagings are authorized, subject to the requirements of subparts A and B of part 173 of this subchapter and the special provisions specified in Column 7 of the §172.101 Table.

(a) *Rail cars:* Class DOT 105, 109, 112, 114, or 120 fusion-welded tank car tanks; and Class 106 or 110 multi-unit tank car tanks.

(b) *Cargo tanks:* Specifications MC 330 and MC 331 cargo tank motor vehicles and, except for Division 4.2 materials, MC 312 and DOT 412 cargo tank motor vehicles.

(c) *Portable tanks:* DOT 51 portable tanks.

§173.245 Bulk packaging for extremely hazardous materials such as poisonous gases (Division 2.3).

When §172.101 of this subchapter specifies that a hazardous material be packaged under this section, only the following bulk packagings are authorized, subject to the requirements of subparts A and B of part 173 of this subchapter and the special provisions specified in Column 7 of the §172.101 Table.

(a) Tank car tanks and multi-unit tank car tanks, when approved by the Associate Administrator for Hazardous Materials Safety.

(b) Cargo tank motor vehicles and portable tanks, when approved by the Associate Administrator for Hazardous Materials Safety.

§173.247 Bulk packaging for certain elevated temperature materials (Class 9) and certain flammable elevated temperature materials (Class 3).

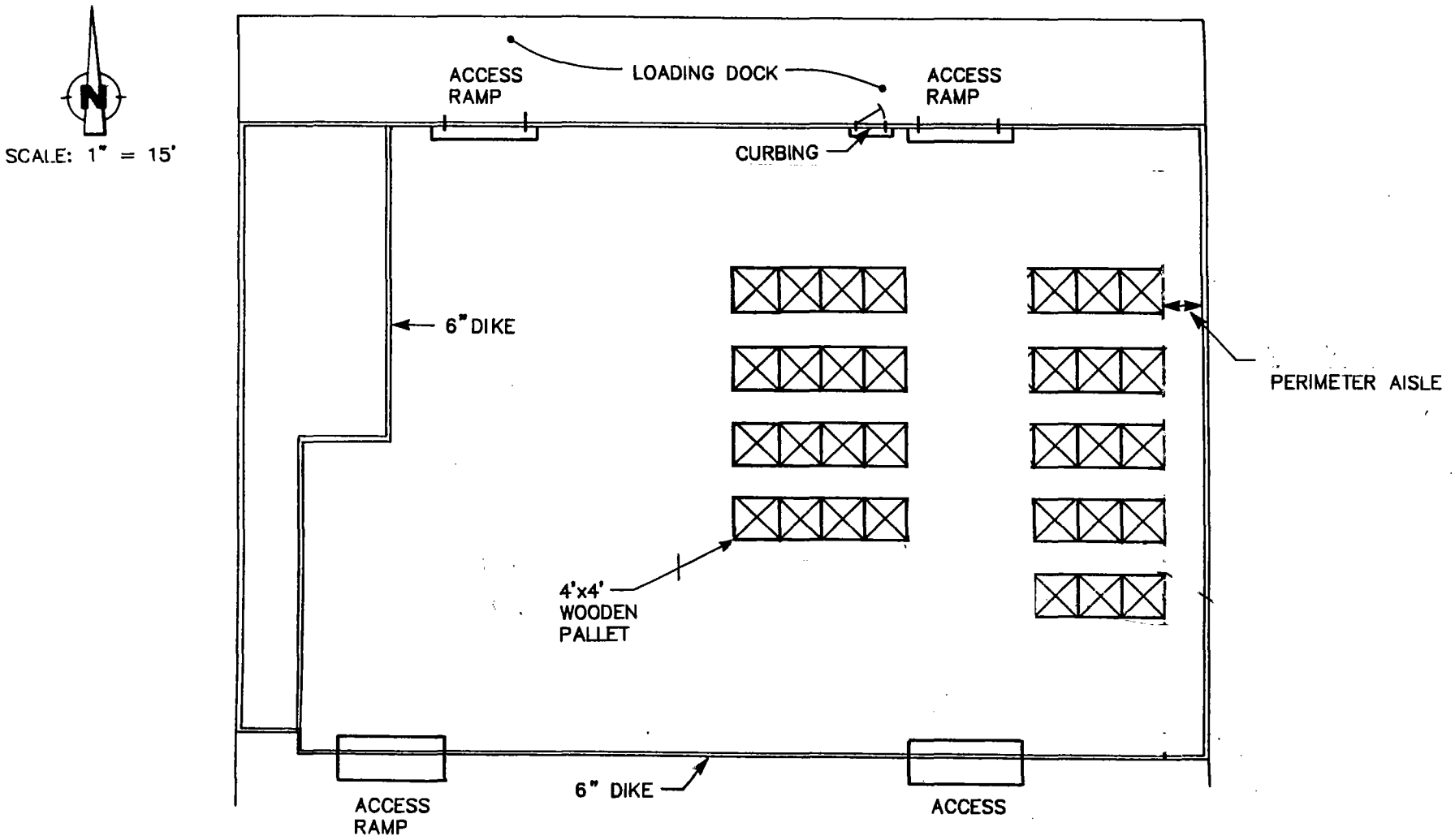
When §172.101 of this subchapter specified that a hazardous material be packaged under this section, only the following bulk packagings are authorized, subject to the requirements of subparts A and B of part 173 of this subchapter and the special provisions in Column 7 of the §172.101 Table. On or after October 1, 1993, authorized packagings must meet all requirements in paragraph (g) of this section unless otherwise excepted.

(a) *Rail cars:* Class DOT 103, 104, 105, 109, 111, 112, 114, 115, or 120 tank car tanks; Class DOT 106, 110 multi-unit tank car tanks; AAR Class 203W, 206W, 211W tank car tanks; and non-DOT specification tank car tanks equivalent in structural design and accident damage resistance to specification packagings.

ATTACHMENT D-4

FACILITY DESIGN DRAWINGS – CURBS AND RAMPS

ATTACHMENT D–



EXAMPLE

CONTAINER ARRANGEMENT
Detrex Corporation
Melrose Park, Illinois Facility

ATTACHMENT D-5

COATING SPECIFICATIONS AND MANUFACTURERS APPLICABILITY DETERMINATION

INTERNATIONAL COATINGS INC.

2925 Lucy Lane, Franklin Park, Illinois 60131 • 708/451-0279 • 800/624-8919 • Fax 708/451-0379

SPECIFICATION FOR INSTALLATION OF EPOXY FLOOR AND WALL SYSTEMS FOR SECONDARY CONTAINMENT AREAS

1.00 SCOPE

1.01 SECTION INCLUDES:

1.01.1 Epoxy System for Secondary Containment Areas

1.02 RELATED SECTIONS:

1.02.1 Section 3.02; Concrete subfloor steel trowelled with a light broom finish

1.02.2 Section 07900 - Joint Sealants - Expansion joints

1.03 SUBMITTALS

1.03.1 Submit all applied samples and printed information to the Project Engineer.

1.03.2 Product Data: Provide two copies of manufacturers MSDS pages and product data on specified products describing physical performance characteristics, chemical resistance, available colors and packaging.

1.03.3 Provide complete Installation Instructions published by manufacturer. This should include special procedures, perimeter termination procedures, substrate joint and crack treatment, treatment for penetrations, surface mounted and equipment bases, cove and cant cove applications, adjacent and integral wall or vertical surface treatment and recommendations and procedures for establishing anti-slip profile on completed surfaces.

1.03.4 Furnish written Maintenance procedures as specified in section 1.09

1.03.5 Furnish written proof of Applicator Certification by the manufacturer.

1.03.6 The installation of all epoxy coating materials will be the responsibility of an applicator certified and approved by the manufacturer of the specified materials.

1.03.7 The manufacturer will submit a written statement detailing a schedule of application inspections to be accomplished by the manufacturers representative to assist the Owner in assessing compliance with project specifications, quality control and the manufacturer's recommended application instructions.

1.04 QUALIFICATIONS

1.04.1 Manufacturer: Manufacturer shall be a company specializing in the manufacturing of all products in the system specified in this section with a minimum of five (5) years experience.

1.04.2 Applicator: Company specializing in performing the work of this section with a minimum of three (3) years experience. Must be certified by the manufacturer of the material as having successfully completed the manufacturer's training and certification process.

1.04.3 Supervisor: Must have been trained by the manufacturer.

1.04.4 Applicators not certified by material manufacturer must arrange for full time instruction by the manufacturer throughout the time of the complete application. Such arrangements must be at the discretion of the manufacturer at their prevailing rates, all costs to be paid by the applicator.

1.05 REGULATORY REQUIREMENTS

1.05.1 Installation must conform to all State, County and City codes.

1.05.2 All materials must be 100% solids with no emissions of VOCs, known carcinogens or other hazardous materials.

1.06 DELIVERY, STORAGE AND HANDLING

1.06.1 Deliver, unload, store, protect and handle all specified products required on this project. All materials must be delivered to the job site in sealed, undamaged containers.

1.06.2 All containers shall have proper DOT labeling, material name, date of manufacture, color and batch number where appropriate.

1.06.3 Materials should be allowed to stabilize at the storage temperatures for a minimum of three days prior to application.

1.07 ENVIRONMENTAL REQUIREMENTS

1.07.1 Temperature in area of application shall be maintained at the ambient temperature recommended by the manufacturer for a minimum of 24 hours prior to, during and after the application of any materials unless otherwise prescribed by the manufacturer.

1.07.2 During the application of any materials and for the duration of the prescribed curing time the floor surface shall be protected from the direct air flow of any heat or cooling duct, open window or door.

1.08 WARRANTY

1.08.1 Applicator will provide a written one year warranty on company letter head, signed by an officer of the corporation and notarized.

1.08.2 Warranty shall cover any defects in material or application that produces delamination from the substrate, degradation of the surface and excessive signs of wear.

1.08.3 Warranty from the applicator shall detail the product or system used, manufacturer name and address and copy of manufacturer's warranty.

1.08.4 Warranty will detail procedures to be used in formal notification of applicator when a suspected defect or problem is to be addressed by the applicator. The contact information for the manufacturer will be furnished to allow the owner to send duplicate of formal notification to the manufacturer.

1.09 MAINTENANCE DATA

1.09.1 Furnish complete maintenance data from the manufacturer covering recommended periodic maintenance steps, maintenance materials, procedures for regular cleaning, stain removal, spot repairs.

1.09.2 Furnish recommendations from manufacturer for schedule of periodic inspections by representative of the manufacturer.

1.09.3 Submit a list of wet samples of each product that will be supplied at no charge to owner to be retained for touch-up of damaged areas.

1.10 INSTALLATION DESCRIPTION

1.10.1 The scope of the installation will be detailed in a separate document and will include the description of the area and the system or systems to be installed in the area or areas.

1.10.2 The installer shall be responsible for verifying all measurements of the work area described verbally, by drawings or by written instructions and shall describe those measurements used as the basis for his submittals.

1.10.3 When instructed the installer will submit a unit pricing quotation based on the instructions, materials systems and specifications contained herein.

1.10.4 Any changes to the original description of the project scope shall be done only after instructed to do so in writing and accepted in writing. The written documents shall include any agreed upon change in cost to the owner.

2.00 PRODUCTS

2.01 MANUFACTURER

2.01.1 International Coatings, Inc. Franklin Park, Illinois

2.02 MATERIALS

2.02.1 Provide materials as specified herein. All products specified for the total coating system installation shall be manufactured by a single manufacturer. All products shall meet or exceed the performance specification of those products specified. The products named are those established as most suitable for the intended use and establish a desired level of quality and performance.

2.02.2 Other systems are acceptable as alternates upon submittal of acceptable documentation of comparative testing accomplished by independent testing laboratories. Such testing shall be of a qualitative and quantitative analysis and include comparison of performance characteristics of the standard with the alternate. All such testing will be done at the expense of the submitter.

2.02.3 REFERENCES

ASTM D2730 E2	Tensile Properties for Organic Coatings
ASTM D2697 E1	Absorption of Chemical Resistant Coatings
ASTM D4060	Test method for Abrasion Resistance of Organic Coatings Tabor Abrasor
ASTM D 638	Tensile Elongation
ASTM C 307	Tensile Strength
ASTM C 580	Flexural Strength
ASTM C 579	Compressive Yield
ASTM C 399	Fracture Toughness
ASTM D 790	Flexural Strength

2.02.4 COATING SYSTEM

Coating System shall be a chemical resistant, low odor, 100% solids epoxy novolac material that has no VOC and no known carcinogens. The system shall be available in a coating, 1/4" hand trowelled overlayment, block filler, trowelled vertical liner, primer and chemical resistant caulking.

2.02.5 PRIMER

ICO-PRIMER FC as manufactured by International Coatings of Franklin Park, IL . Material shall be a low odor, two-part, solvent free epoxy designed for maximum penetration and sealing of porous surfaces to enhance adhesion and assist in the prevention of outgassing. It should have excellent adhesion to tile, brick and damp or dry concrete. It should prevent the excessive absorption of resin in the finish application into the substrate. It shall cure normally at temperatures between 32"F and 50"F or higher and also be available in versions to cure below 32"F.

2.02.6 HAND TROWELLED OVERLAYMENT-HIGH CHEMICAL RESISTANCE

ICO-SUPER GUARD as manufactured by International Coating of Franklin Park, IL. The material shall be a low odor, three part, solvent free 100% solids epoxy novolac overlayment with moderate resilience to resist thermal and mechanical shock. It should be a trowelled in-place material, normally applied to a nominal thickness of 1/4" without needing a final topcoat to seal it's surface. It shall have a resin rich mix ratio of 2.7:1 aggregate to resin. Higher mix ratio systems that require a topcoat or surface slurry are not acceptable. It shall have an elongation of 2.0% when tested using ASTM D638, a fracture toughness reading of 980 psi/in./2 when tested against ASTM C399, a compressive yield not to exceed 7000 psi when tested against ASTM C-579 and a tensile strength of at least 1300 psi when tested against ASTM C-307. The material shall have excellent damp adhesion. It must be capable of resisting immersion for 30 days in 98% sulfuric acid, 50% sodium hydroxide, 50% hydrofluoric, MEK, and 7 days in N-Methyl pyrolidone and methylene chloride.

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2.02.7 SELF LEVELLING OVERLAYMENT SYSTEM

ICO-SUPER GUARD SL as manufactured by International Coatings, Inc. Franklin Park, IL is a low odor, three part solvent free 100% solids epoxy novolac possessing moderate resilience to thermal and mechanical shock. It shall have a bond strength to quarry tile of over 1000 psi, an elongation of 5%, compressive strength of 10,230 psi, tensile strength of 2075 psi and flexural strength of 3825 psi.

2.02.8 TROWELLED VERTICAL LINER-High Chemical Resistance

ICO-LINER as manufactured by International Coatings, Franklin Park, IL. The material shall be a low odor, three-part solvent-free 100% solids epoxy novolac designed to line such vertical surfaces as berm walls, sumps, pits and trenches. It shall have an elongation of 5% when tested against ASTM D-638, developing moderate resilience to resist thermal and mechanical shock. It should be able to be trowel applied at thicknesses up to 1/8" in one pass without developing shrinkage cracks. It shall have a mix ratio of 1.3:1 by volume of graded aggregate to resin and hardener and have excellent adhesion to tile, brick and damp as well as dry concrete. It shall be unaffected by 36% hydrochloric acid, 50% nitric, 98% sulfuric acid, methylene chloride, MEK and acetone.

2.02.9 COATING-High Chemical Resistance

SUPER GUARD COATING as manufactured by International Coatings, Franklin Park, IL. The material shall be a low odor, solvent free, 100% solids flexibilized epoxy novolac coating with moderate resilience to resist thermal and mechanical shock. It shall be roller applied at a minimum thickness of 15 mils per coat on vertical surfaces without evidence of slumping with a minimum of two coats used. It shall have an elongation of 2% when tested using ASTM D638 and a minimum tensile strength of 380 psi, flexural strength of 7035 psi, bond strength to quarry tile over 1000 psi. It shall be able to resist 30 day submersion test of 37% hydrochloric, 50% hydrofluoric, 98% sulfuric, dimethyl formamide, tetrahydrofuran, MEK and acetone.

2.02.10 ICO-GEL

ICO-GEL as manufactured by International Coatings of Franklin Park, IL. The material shall be a low odor, solvent free, three part epoxy with bond strength exceeding 1000 psi on quarry tiles. It should be able to be applied on vertical surfaces up to 1" thick at 77°F in a single step application without sagging. The system must adhere to damp, as well as dry concrete. It shall be resin-rich mixture, with a sand: liquid ration not to exceed 1.5:1 by volume. The compressive strength when tested in accordance with ASTM C-579 shall not exceed 6200 psi and the tensile strength shall be 1810 psi when tested under ASTM C-307. The system shall be unaffected by oils, greases, caustics and mild acids.

2.02.11 SEALANT

ICO-CAULK-X as supplied by International Coatings of Franklin Park, IL. The material shall be a highly chemical resistant single component gun grade caulking compound, able to remain flexible down to -65°F. It should be usable in horizontal as well as vertical joints without slumping in normal joint volumes. It should have an elongation of at least 550%, a Shore A hardness of 28., tensile strength of 150 psi, peel strength of 20 psi. It must pass 72 hour immersion tests of 10% nitric, 30% phosphoric, 50% sulfuric, methylene chloride, MEK and toluene. The material shall be supplied in 10 oz. tubes.

2.02.12 SLIP-RESISTANT SURFACING

The finished surface of all materials shall be a slip-resistant profile created in the final coat. It shall be of a type as recommended by the manufacturer of the coating system used.

3.0 INSTALLATION

3.01 SURFACE EVALUATION

The following tests and observations should be made by the applicator to insure the concrete substrate is acceptable for the application of the specified system. All tests and necessary corrections of defects must be accomplished by the responsible trades prior to application of any of the materials specified herein.

3.01.1 TENSILE STRENGTH

Tensile strength testing according to ASTM D4541-85 shall exceed 275 psi.

3.01.2 MOISTURE CONTENT

Moisture content shall be tested according to ASTM D4263-88 by taping a 2' x 2' plastic sheet of 10 mils minimum thickness. The presence of any condensation before 6 hours would indicate excessive moisture and reason for delaying the application.

3.01.3 SURFACE TEMPERATURE

The surface temperature shall be checked on any surfaces to be covered to insure the application will be accomplished at the temperature range recommended by the material manufacturer for the material being applied.

3.01.4 VISUAL EXAMINATION

A meticulous visual examination of the surface to be covered will be made to detect areas of skimmed concrete, loose or weak areas. Inspection by sounding with a hammer or dragging a heavy chain followed by marking any defective or hollow surface to identify complete removal of sub-standard concrete.

3.01.5 CURING AGENT

If the presence of a curing agent or form release material is detected applicator will be responsible for insuring those materials are totally removed prior to any coating or overlayment application.

3.02 SURFACE PREPARATION

The following steps should be accomplished following the appropriate International Coatings Application Instructions and specifications as detailed in the published version dated April 22, 1994.

3.02.1 Remove any oil concrete or grease spots with appropriate solvent or chemical degreasing materials followed by pressure washing and insure complete removal of any residue.

3.02.2 Remove any existing failing coatings or patches completely from the floor as well as equipment bases and curbs, exposing the structural concrete slab.

3.02.3 On all old concrete mechanically abrade the surface to remove any contaminated concrete, to insure an absolutely clean surface to chemically bond to.

3.02.4 All new concrete surfaces should be shot blasted, sand blasted or scarified to remove any latency and any curing agents form release agents, contaminants or foreign material that may inhibit or prevent adequate chemical bond. Surface texture after blasting should resemble 80 mesh sand paper after two passes perpendicular to each other.

3.02.5 Acid etching is acceptable as a means of creating open texture to new concrete, removal of laitance and chemical removal of some contaminants. After etching, the surface mst be thoroughly rinsed until rinse water has a ph of 7 or equal to the ph of the clean rinse water. When the floor is dry it must be totally vacuumed to remove all residual dust and concrete particles.

3.02.6 All open cracks, joints and construction joints should be cleaned of all loose debris, dirt, oils or other contaminants.

3.02.7 Remove all failing coatings and rust from all metal equipment feet, bases, metal stair feet, supports and other metal surfaces projecting from the concrete, to a minimum of 4" above the concrete surface.

3.02.8 Cut back and/or remove any joint backing or filler strips in the expansion joints to a minimum of 1-1/2 " deep.

3.02.9 Insert disposable filler in the joints to prevent filling with the overlayment materials and to allow for accurate location of final sawcuts in the overlayment.

3.02.10 All straight line cracks shall be saw cut to produce a minimum joint 3/4" wide and 1-1/4" deep centered over the original crack. Remove all dust and debris and fill as specified for expansion joint application.

3.02.11 All cracks that are not straight line cracks or expansion joints, shall be routed out to produce a minimum joint of 1/4" x 1/4". These joints shall be filled with ICO-Gel or a slurry of ICO Primer FC and graded silica aggregate and struck off flush with the surrounding surface.

3.02.12 Cut a key of a least 1/2" x 1/2" around the perimeter of all drains, steel posts and any other penetrations and remove all dust, dirt or loose particles. Remove any rust, sealants or coating material from the drain ring.

3.02.13 Saw cut the concrete where there will be a stopping point for the overlayment application that does not meet a rising or vertical surface. The inside edge of the saw cut should be chipped away at a 45^0 angle to form an undercut key for the edge of the application.

3.03 NEW CONCRETE FINISHING

3.03.1 NEW CONCRETE SURFACES

All new concrete surfaces that will be covered with the systems specified herein should have received a steel trowel light broom finish and be free of all curing agents or sealer applications. The surface will be prepared as detailed in 3.02.

3.04 MATERIALS APPLICATION

3.04.1 Trowel coat all curbs, column bases and vertical surfaces that have been eroded by chemical attack with Vertical Liner (ICO-Liner) applied at a nominal 1/8" thickness, smoothing the material to close the surface so that no voids or pinholes are left. If application temperatures are above 90°F, a maximum of 1 cup (8oz) of mineral thickener can be used.

3.04.2 Apply primer to all walls up to a height of the first mortar joint above the floor level. Primer should be applied in a liberal fashion to insure penetration of the pits and openings of the surface. Allow to dry a minimum of 4 hours. Any areas that "dull out" should be recoated so the finish surface has a uniform sheen.

3.04.3 Fill all bugholes with (ICO-Gel) epoxy paste, striking off the material smooth and flush with the surrounding surface.

3.04.4 When the ICO-GEL is dry, apply two coat of ICO-Super Guard Coating to the block walls specified at the rate of 100 SF per gallon per coat.

3.04.5 On all smooth concrete walls, apply two coats of ICO-Super Guard Coating at the rate of 100 SF per gallon per coat. The application should be uniform with no misses, holidays, runs or streaks.

3.04.6 Apply primer (ICO-Primer FC) to all horizontal surfaces that will be covered within 24 hours with the overlayment material. The coverage rate should be 200 SF per gallon.

3.04.7 Any horizontal surfaces requiring more than 1/4" of fill to restore them to a level condition can be covered with ICO-Patch to bring them level with the surrounding smooth surface of the existing floor.

3.04.8 Apply the hand trowelled overlayment (ICO-Super Guard) at a minimum of 1/4" thick following the existing contour of the concrete. The depth shall be set with pinguides, gauge rakes, screed strips or other measuring devise that will insure specified minimum depth.

3.04.9 The overlayment should not be diluted or mixed with solvent. Caution should be exercised to insure the mix ratios recommended by the manufacturer are strictly adhered to.

3.04.10 After spreading and finish trowelling is complete the surface can be backrolled with IPA dampened rollers to bring up the resin. There should be no dripping or puddling of IPA on the surface. The rolling should smooth out trowel marks and other surface imperfections.

3.04.11 After backrolling, the surface should be covered with a uniform dusting of 30-40 mesh grade sand, applied at the rate of 1/4 pound per square foot.

3.04.12 After a minimum of 12 hours curing time all loose sand should be removed by sweeping and vacuuming and discarded.

3.04.13 A 45° cant cove shall be formed at the intersection of all floor and rising vertical surfaces. The face of the cant cove shall be approximately 2" wide and be made of ICO-Super Guard bodied up with suitable filler.

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3.05 MATERIALS APPLICATION - EXPANSION JOINT

3.05.1 Remove the disposable joint filler from the expansion joints by sawcutting the overlayment above all expansion joints exposing the full width and length of the joint down to the joint in the concrete substrate.

3.05.2 Insert compressible closed cell joint backing in all expansion joints using a large enough size to provide 30% compression. The joint backing should be forced down in the joint to a depth equal to one-half the joint width, not to exceed 3/8" deep.

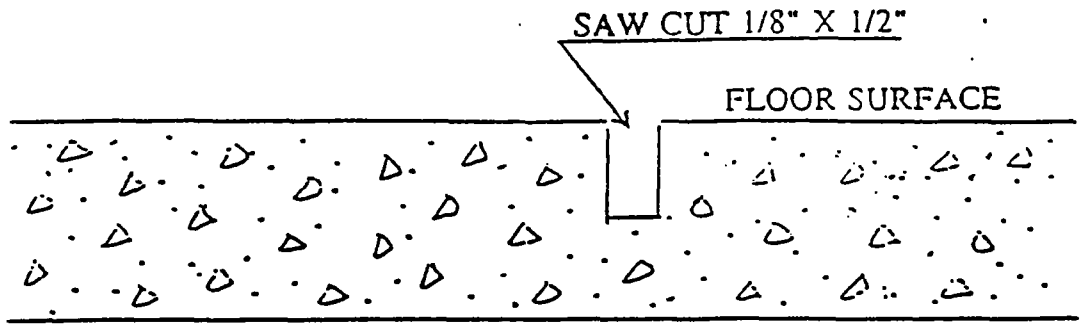
3.05.3 Caulk all expansion joints with the sealant (ICO-Caulk X) and tool the bead to insure full and complete bead contact. Finish bead should be neatly aligned with the saw cut joint edge with no gaps, strings or air bubbles.

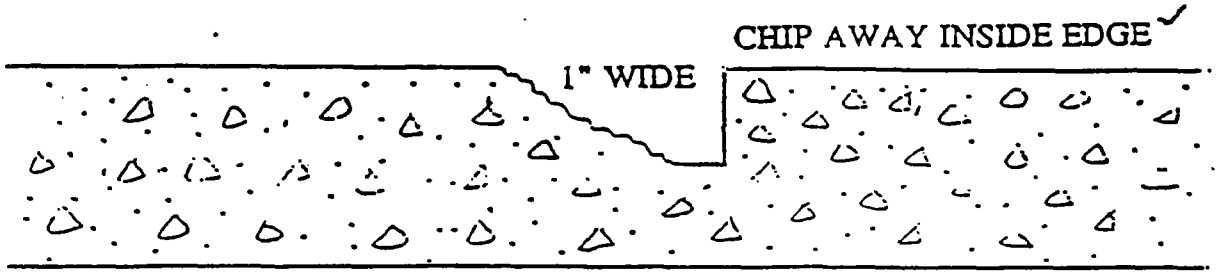
3.06 PROTECTION OF FINISHED WORK

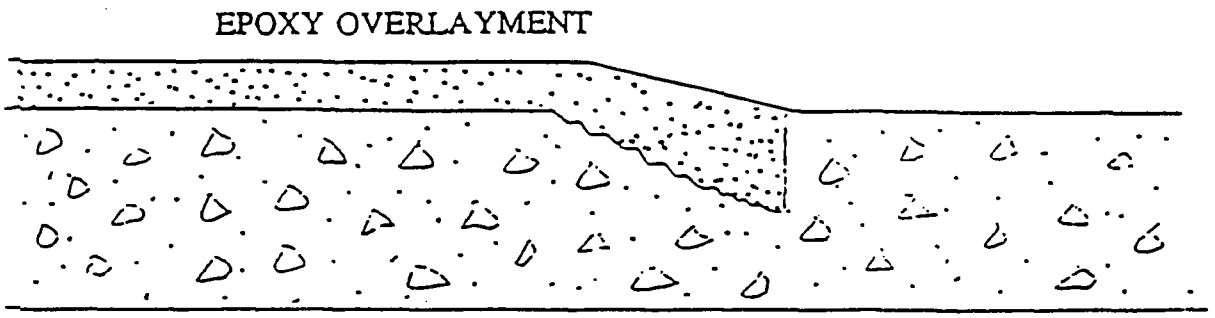
3.06.1 Prohibit traffic on floor finish for 24 hours after installation at ambient temperature at 70°F. (contact manufacturer for protection times required at temperatures below 50°F)

3.06.2 Barricade area to protect application until fully cured.

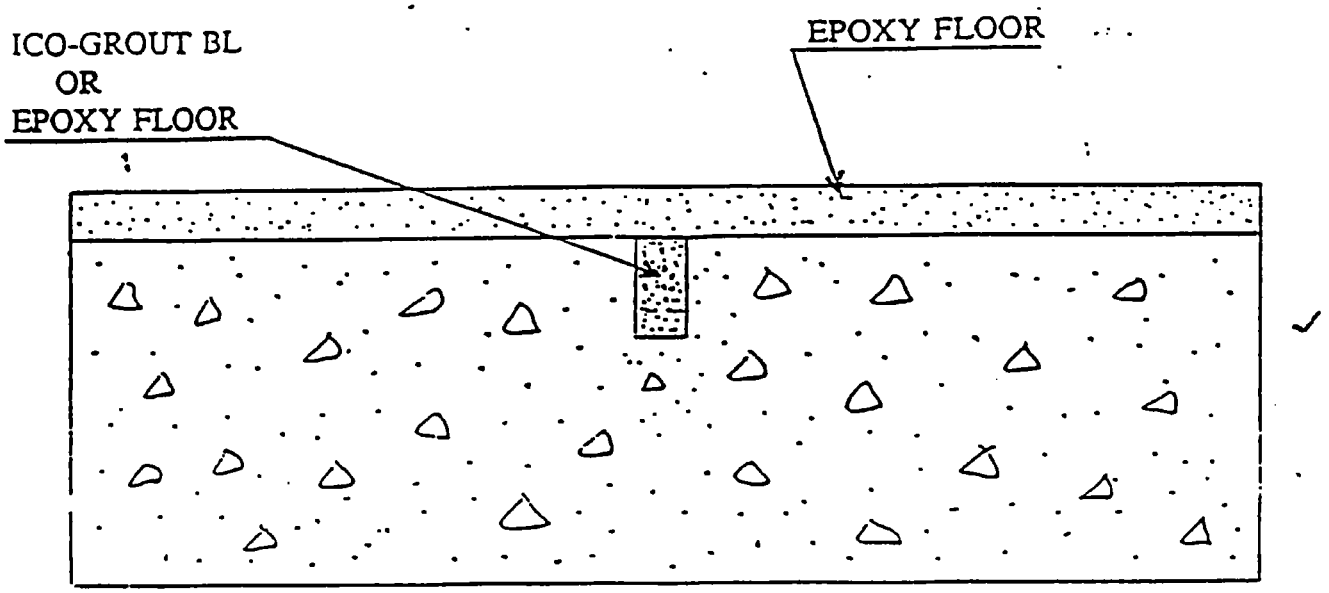
DRAWING DETAIL 1. PERIMETER KEY



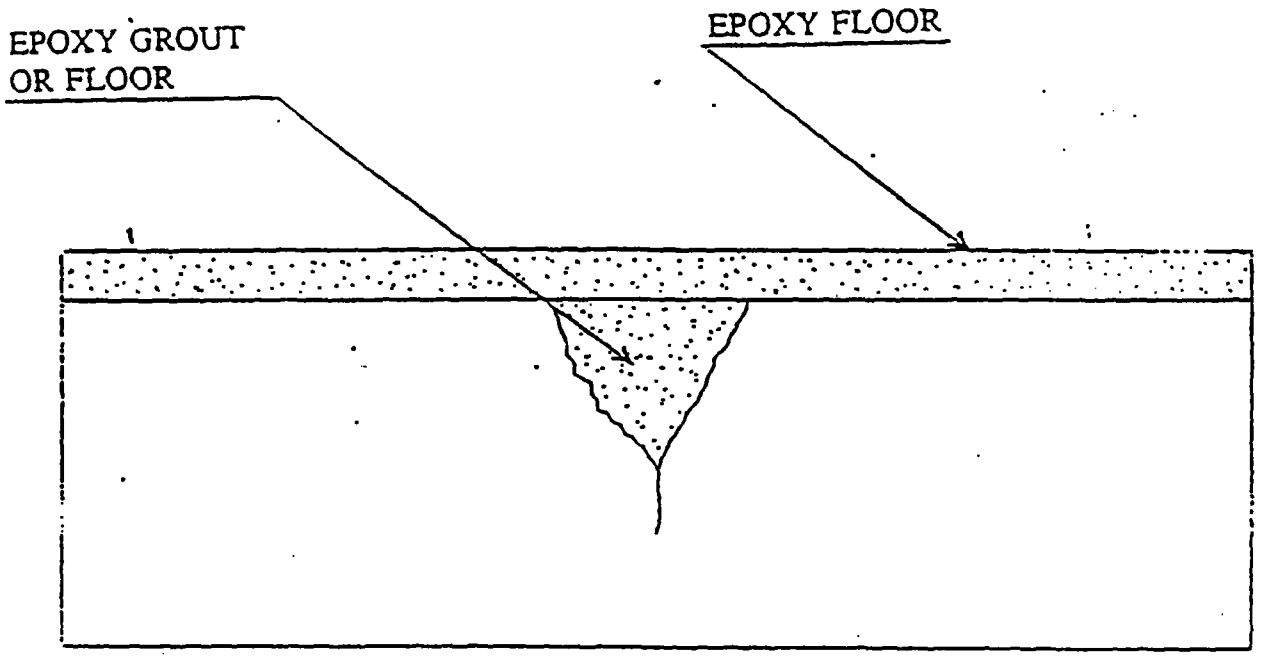




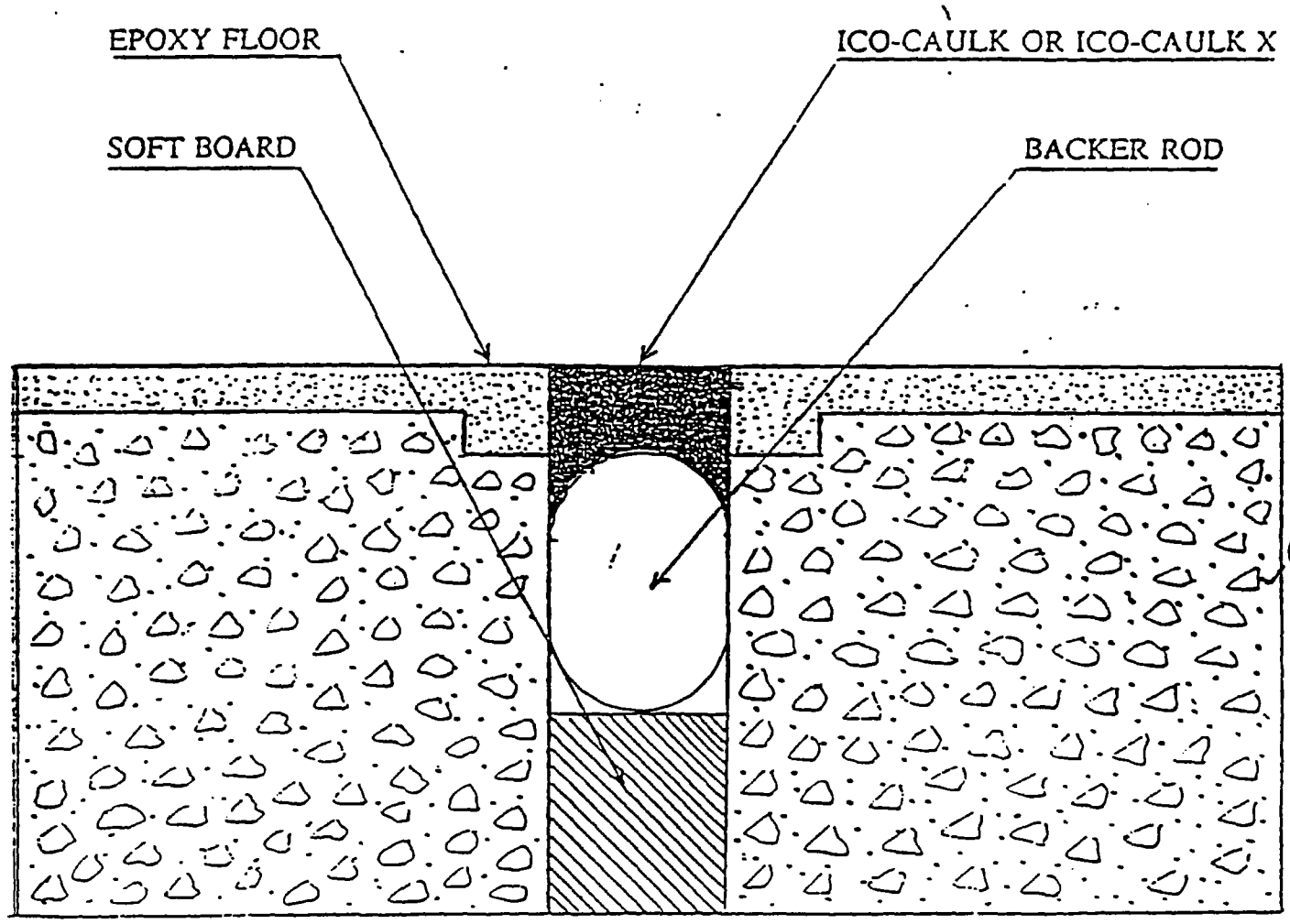
DRAWING DETAIL 2. CONTROL JOINT - NO CRACK FAILURE



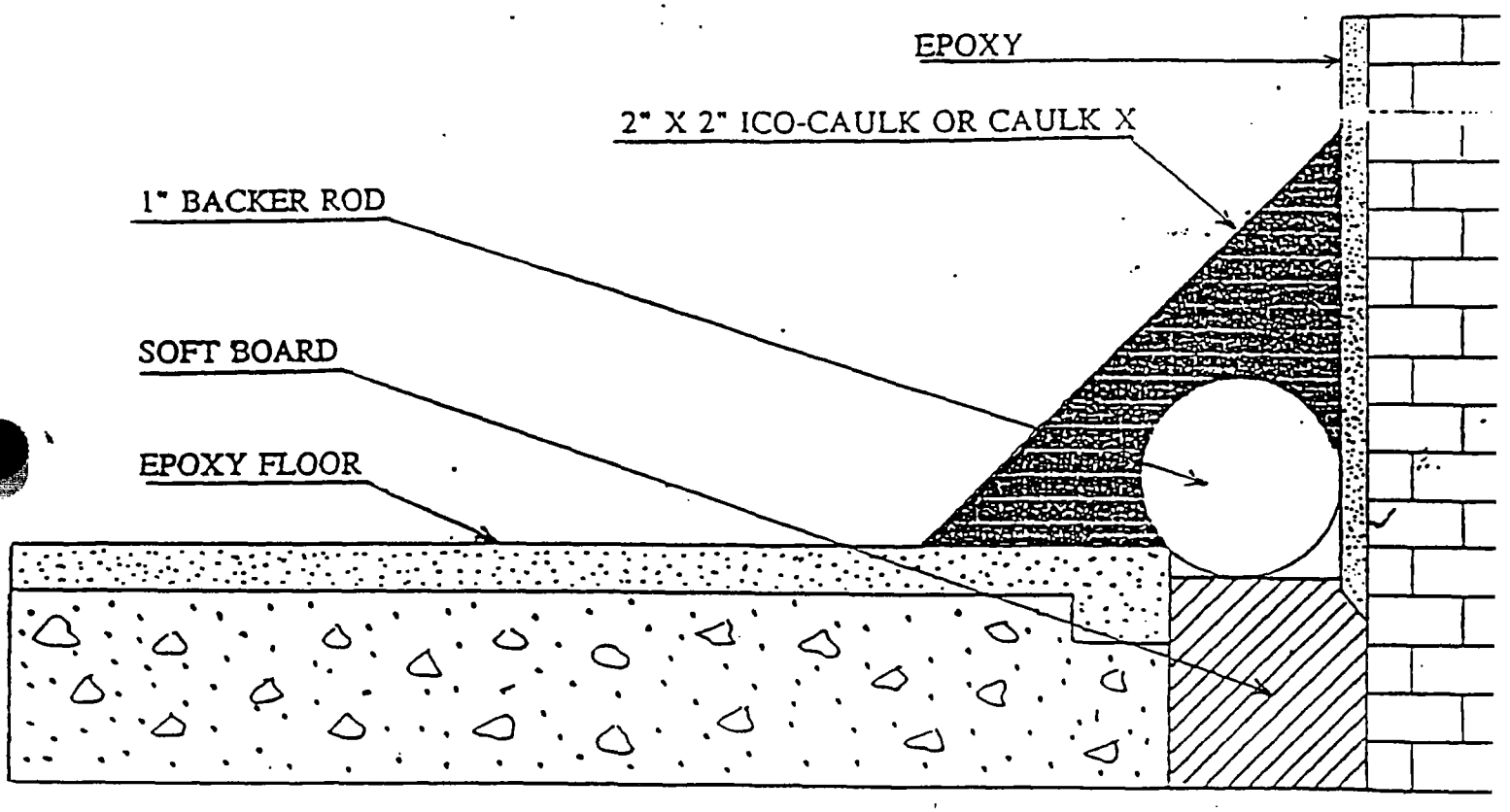
DRAWING DETAIL 3. CRACK REPAIR

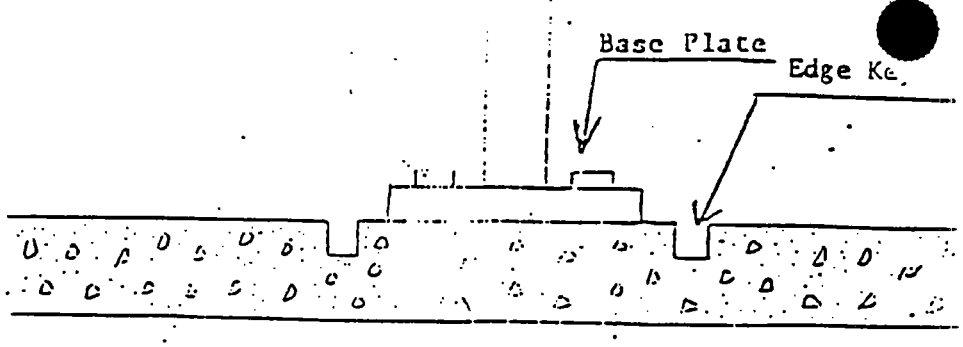


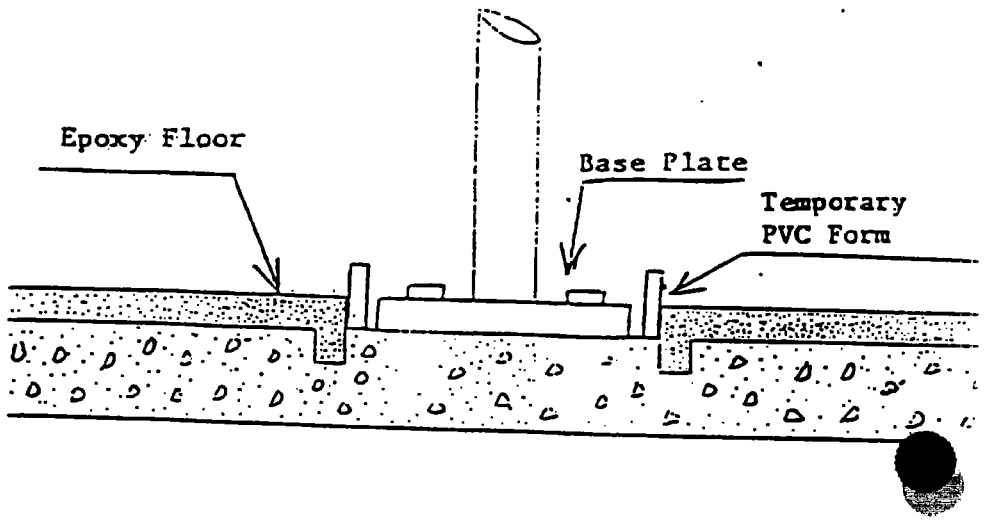
DRAWING DETAIL 4. EXPANSION JOINT

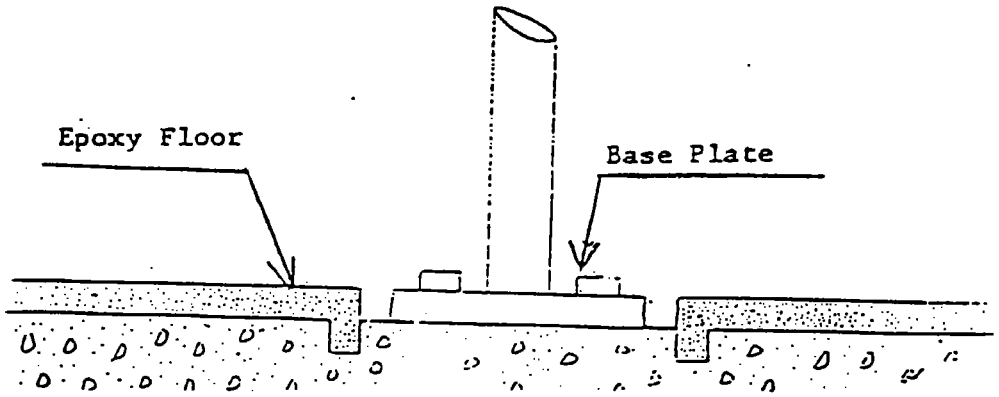


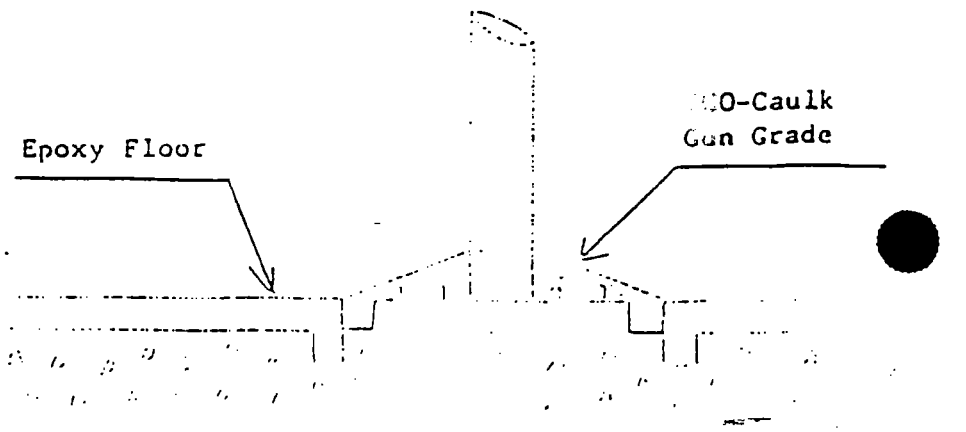
DRAWING DETAIL 5. CORNER EXPANSION JOINT



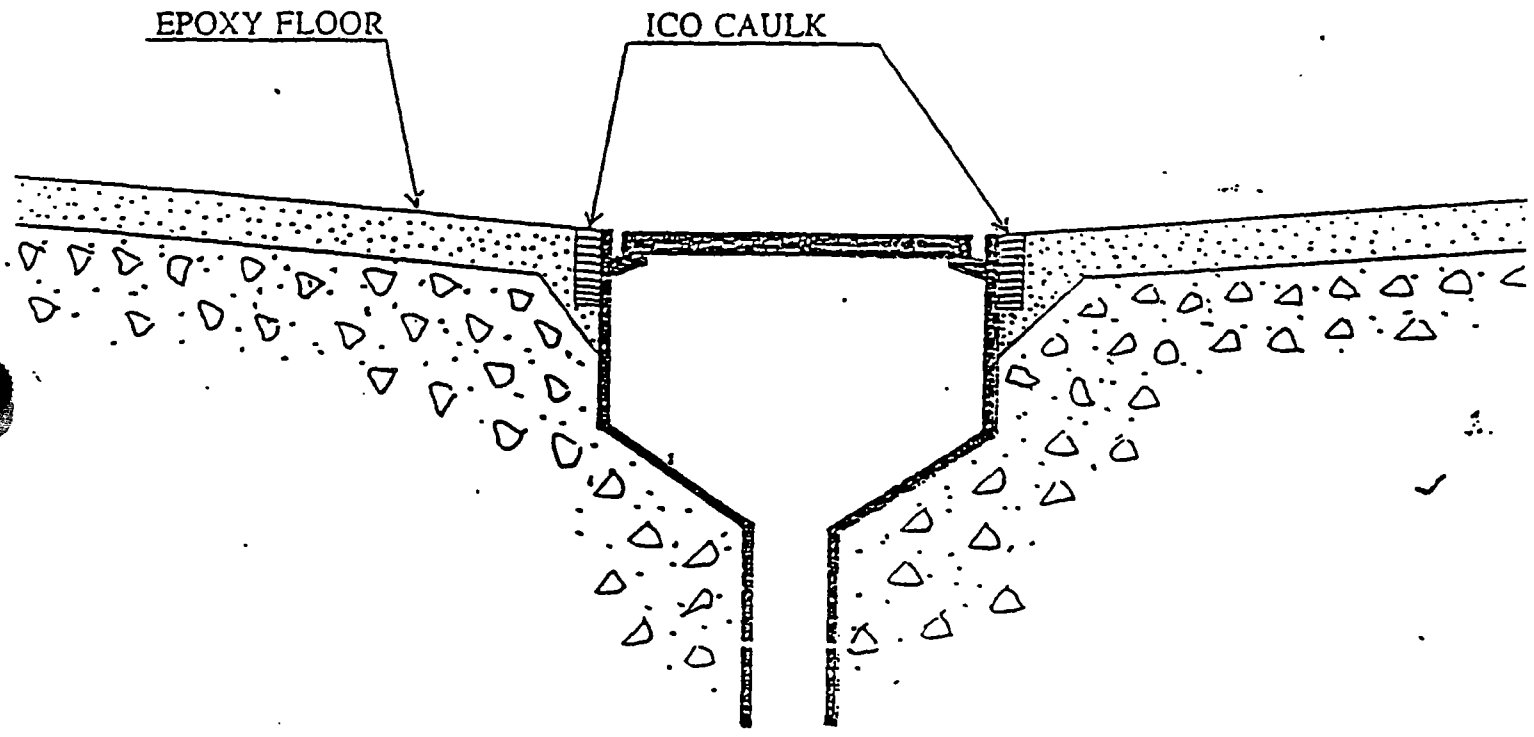

Base Plate
Edge Ke


Epoxy Floor
Base Plate
Temporary
PVC Form

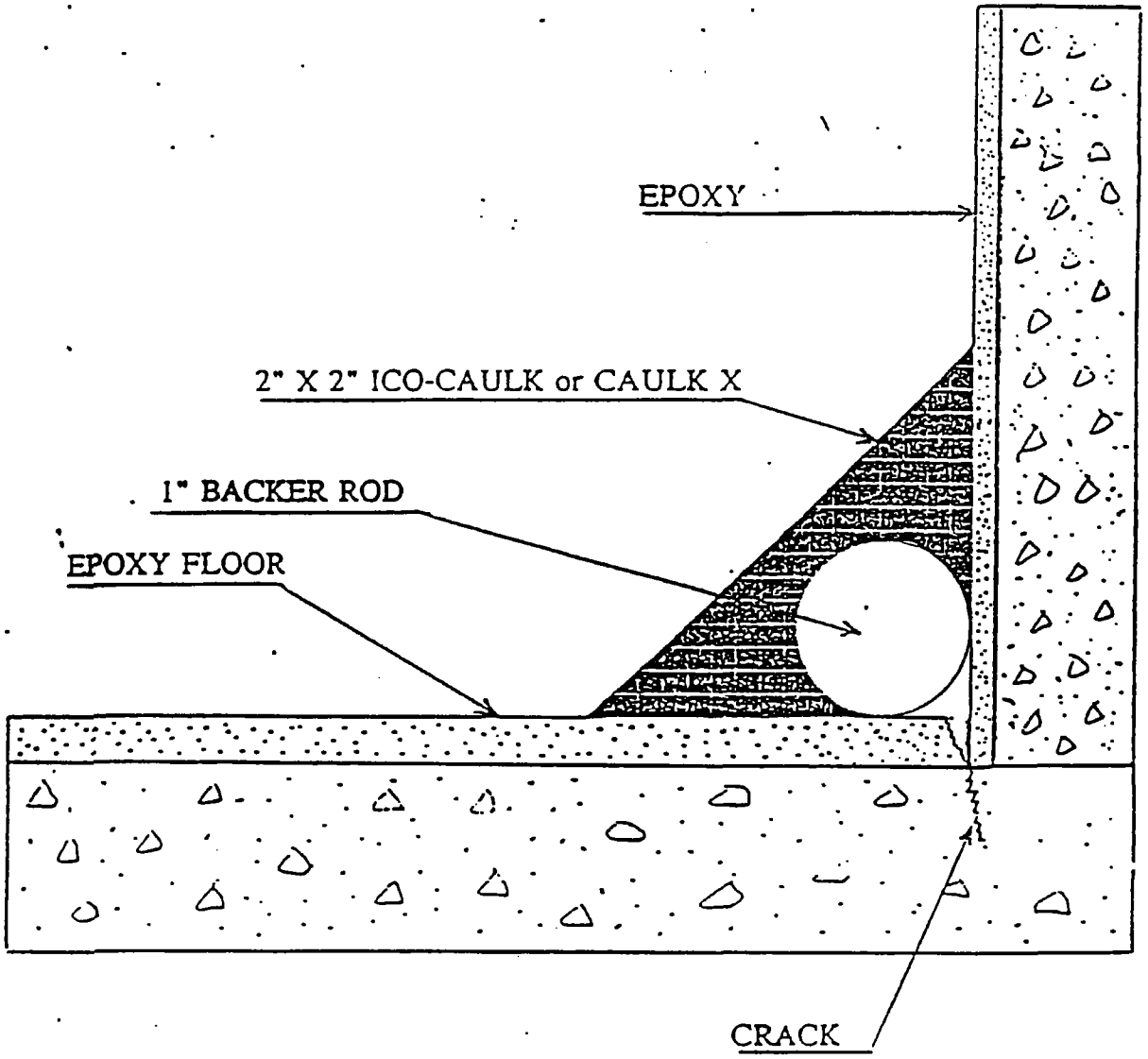

Epoxy Floor
Base Plate


Epoxy Floor
O-Caulk
Gun Grade

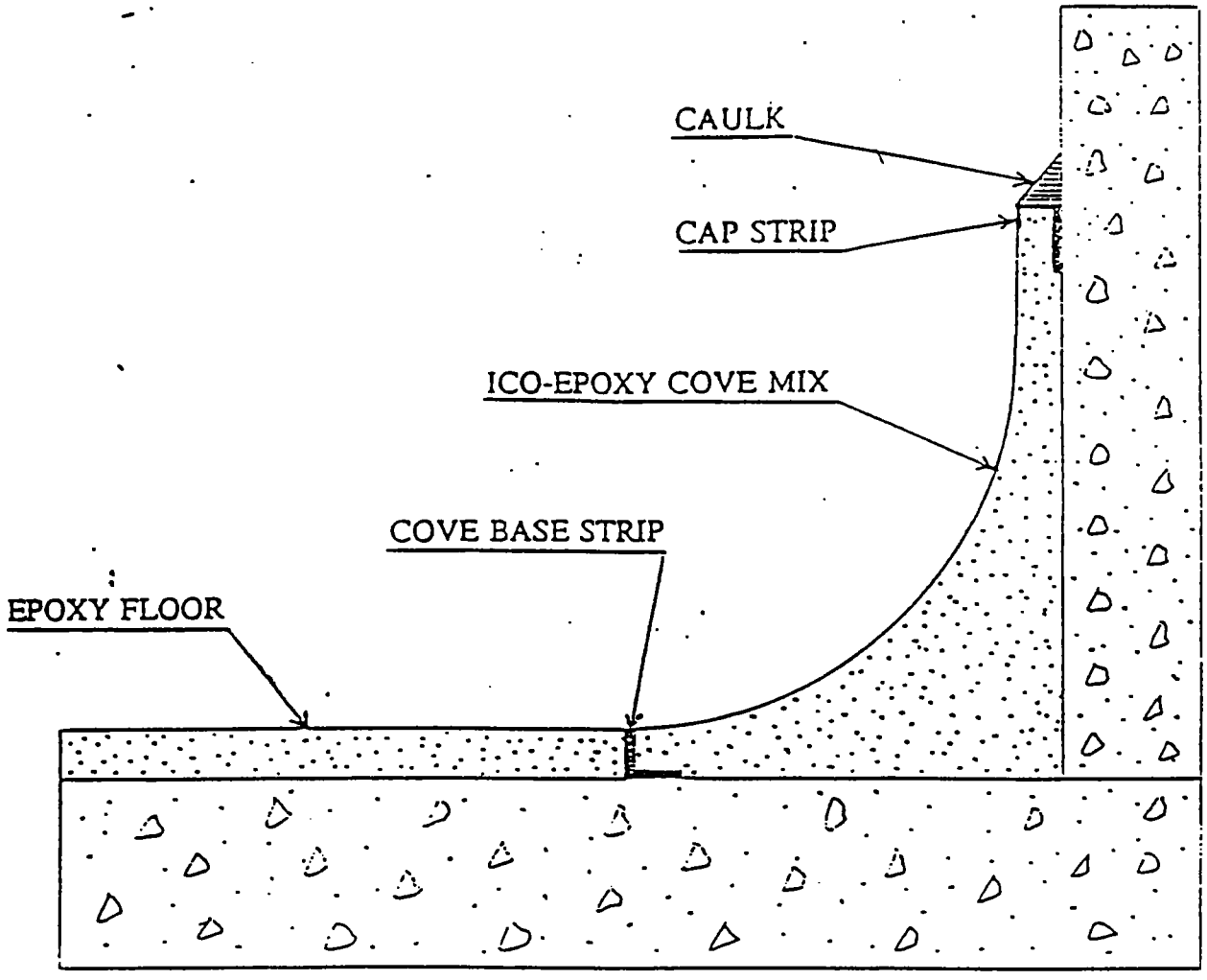
DRAWING DETAIL 7. DRAIN



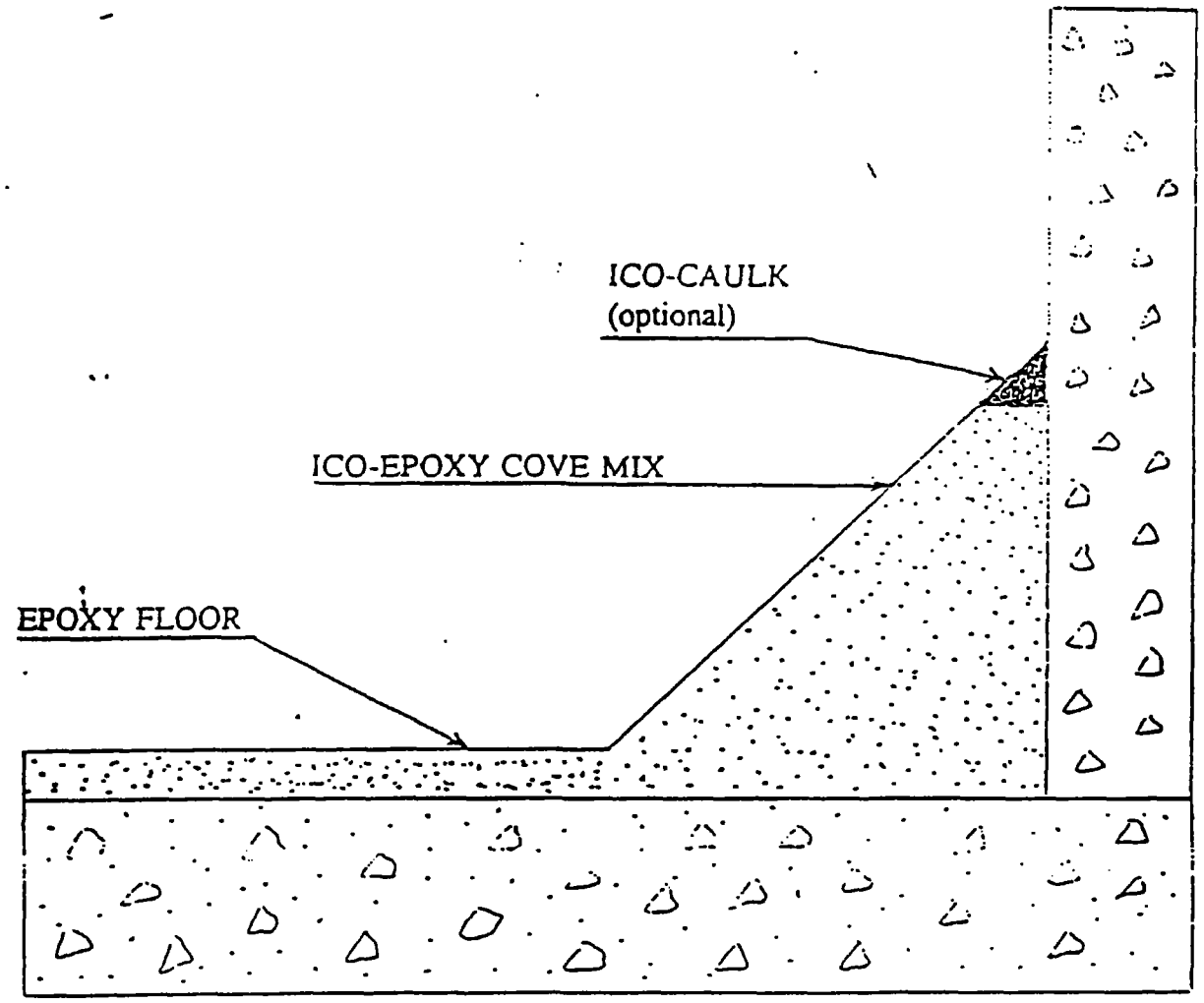
DRAWING DETAIL 8. CORNER DETAIL
NO EXPANSION JOINT



DRAWING DIAGRAM 9. COVE BASE



DRAWING DETAIL 10. CANT COVE BASE



INTERNATIONAL COATINGS INC.

Resilient Epoxy Flooring and Grouting Systems

PRODUCT DATA SHEET

ICO-SUPER GUARD™

Product Description

ICO-Super Guard™ is a solvent free, 100% solids, three part epoxy floor system hand trowelled in one pass in any thickness down to 3/16". It is our highest performing flooring system with excellent chemical resistance to concentrated acids, caustics and solvents. As a high performing epoxy novolac, it has superior heat resistant properties compared to conventional epoxies — up to 212°F for constant exposure. The enhanced toughness of **Super Guard™** allows for better resistance to thermal and mechanical shock, compared to harder, more brittle conventional materials.

Its resin rich mix eliminates the need for a top sealer coat, thereby reducing the downtime and improving resistance to moisture penetration even under heavy wear. **Super Guard's™** excellent adhesion to damp as well as dry concrete allows it to be applied over relatively new concrete, even outdoor slab-on-grades. To enhance its crack bridging capabilities, it can be applied over our elastomeric material, **ICO-Lastic™**, or reinforced with our chopped glass fibers.

Typical Application

ICO-Super Guard™ is particularly recommended in truck unloading pads, large tank farms and drum storage areas subjected to moderate to heavy mechanical wear where secondary containment for hazardous materials is mandated by regulatory agencies. Its outstanding chemical resistance makes **Super Guard™** an effective flooring material for acid etching and metal plating lines, as well as for solvent recycling centers, chemical processing plants and other highly corrosive areas.

Chemical Resistance

ICO-Super Guard™ is recommended for areas subjected to such chemicals as 98% sulfuric, 50% hydrofluoric, 50% nitric acid, methylene chloride, dimethyl formamide, acetone and trichlorethylene. A more complete list of chemical resistances is available in the **International Coatings Chemical Resistance Chart** or contact **ICO** Technical Assistance.

Physical Properties

Tensile Strength (ASTM C-307)	1475 psi	Flammability (D-635)	Self Extinguishing
Tensile Elongation, (C-307)	3%	Vapor Transmission Rate (E-96)	.27 perms
Flexural Strength (C-580)	2580 psi	Coefficient of Thermal Expansion (D-696)	5.9 x 10^{-5} per °F
Compression Strength (C-579)	6770 psi	Gardner Impact (D-2794)	120 in lbs.
Hardness, Shore D (D-2240)	72	Water Absorption (D-570)	0.2% in 24 hours
Bond Strength to Quarry Tile	> 1000 psi	Fracture Toughness (C-399)	980 psi/$in^{1/2}$

Physical Characteristics

Density, lbs./gal
Pt. A 9.7
Pt. B 7.7
A & B Mixed 9.3

Viscosity @ 77°F, cps
Pt. A 850
Pt. B 100
A & B Mixed 750

Shelf Life: 1 year at 77° in unopened containers

Mixing Ratios	**By Volume**	**By Weight**
Pt. A : Pt. B	4:1	5:1
Aggregate: Liquid	3.1:1	5:1

Curing Times @	**60°F**	**77°F**	**90°F**
Pot Life	40 min.	35 min.	25 min.
Working Times	15 min	20 min.	20 min
Hard, Foot Traffic	18 hrs.	12 hrs.	4 hrs.

Maximum hardness and chemical resistance are achieved after 7 days at 77°F.

Color Availability

Standard colors: gray, dark gray, beige, red, green, brown, black.

Packaging and Coverage Rates

Basic Kit	28 SF at 1/4"
Bulk Pack	280 SF at 1/4"
Drum Kit	2800 SF at 1/4"

SEE REVERSE SIDE FOR WARRANTY AND CAUTION STATEMENT

Corro-Shield International, Inc.

7047 Barry Street
Rosemont, Illinois 60018
708-298-7770

Corro Ultra-Cote Chemical Resistance Chart

Chemical		Rating
Acetic Acid -	10%	FS
Acetic Acid -	20%	FS
Acetic Acid -	36%	NR
Acetic Anhydride		OS
Acetone		FS
Acrylonitrile		NR
Alum		FS
Ammonium Hydroxide		FS
Ammonium Nitrate		FS
Aniline		FS
Animal Fats		FS
Beer		FS
Benzene		FS
Black Liquor		FS
Boric Acid		FS
Brake Fluid		FS
Butyl Alcohol		FS
Butyl Cellosolv		FS
Calcium Chloride		FS
Calcium Nitrate		FS
Carbon Tetrachloride		FS
Carbonated Beverage		FS
Chlorine Water		FS
Chloroform		OS
Chromic Acid, 0 - 30%		FS
Citric Acid, conc.		FS
Copper Chloride		FS
Copper Sulfate		FS
Cumene Hydroperoxide		FS
Diesel Fuel		FS
Ethanol		FS
Ethyl Acetate		FS
Ethylene Dichloride		OS
Ethylene Glycol		FS
Ferric Chloride		FS
Ferrous Chloride		FS
Formaldehyde		FS
Formic Acid -	10%	FS
Formic Acid -	30%	NR
Formic Acid -	50%	NR
Freon TS		FS

Chemical		Rating
Gasoline		FS
Glacial Acetic		NR
Green Liquor		FS
n-Hexane		FS
Hydrobromic Acid - 50%		FS
Hydrochloric Acid - 37%		FS
Hydrofluoric Acid - 10%		FS
Hydrofluoric Acid - 30%		FS
Hydrofluoric Acid - 50%		FS
Hydrofluorosilicic Acid	30%	FS
Hydrogen Peroxide	50%	FS
Hydrogen Sulfide		FS
Isoprene		FS
Isopropyl Aclohol		FS
Jet Fuel		FS
Kerosene		FS
Klenzade		FS
Kodak Developer		FS
Lactic Acid -	20%	FS
Lactic Acid -	50%	FS
Lactic Acid -	88%	OS
Maleic Acid		FS
Malic Acid		FS
Methanol		FS
Methyl Acetate		FS
Methyl Esters		FS
Methyl Ethyl Ketone		FS
Methyl Isobutyl Ketone		FS
Methyl Methacrylate		FS
N-Methyl Pyrolidone		OS
Methyl Salicylate		FS
Methylene Chloride		FS
Mineral Oil		FS
Mineral Spirits		FS
Nitric Acid -	10%	FS
Nitric Acid -	30%	FS
Nitric Acid -	50%	NR
Nitric Acid -	conc.	NR
Nitropropane		FS
Oleic Acid		FS
Oxalic Acid		FS

Chemical		Rating
Palm Oil		FS
Perchloroethylene		FS
Peroxyacetic Acid		OS
Phenol		NR
Phosphoric Acid	30%	FS
Phosphoric Acid	50%	FS
Phosphoric Acid	85%	OS
Picric Acid, conc.		FS
Potassium Nitrate		FS
Pyridine		NR
Salt Brine		FS
Silver Nitrate		FS
Skydrol		FS
Sodium Chloride		FS
Sodium Hydroxide - 30%		FS
Sodium Hydroxide - 50%		FS
Sodium Hypochlorite, 5%		FS
Sodium Hypochlorite, 10%		FS
Sodium Hypochlorite, 15%		FS
Stearic Acid, conc.		FS
Soyrene		FS
Sugars		FS
Sulfamic Acid, conc.		FS
Sulfuric Acid -	10%	FS
Sulfuric Acid -	50%	FS
Sulfuric Acid -	80%	FS
Sulfuric Acid -	98%	FS
Tannic Acid -	50%	FS
Tartaric Acid, conc.		FS
Tetrachloroethylene		FS
Tetrahydrofuran		FS
Toluene		FS
1.1.2 Trichloroethane		FS
Trichloroethylene		FS
Trichlorofluoroethane		FS
Tri Sodium Phosphate		FS
Uric Acid		FS
Vinegar		FS
Water, Deionized		FS
Water, Distilled		FS
White Liquor		FS
Xylene		FS

Key: NR - Not Recommended
OS - Occasional Spillage
FS - Frequent Spillage

Note: The above test data was obtained from total immersion tests. The table should be used as a gui as no warranty can be expressed or implied regard accuracy of the information given as it would appl actual plant use. Certain chemicals will discolor th epoxy floor, however, this will in no way affect th integrity of the system.

ATTACHMENT

CORRO-SHIELD INTERNATIONAL, INC.

7047 Barry Street • Rosemont, Illinois 60018 • 708/298-7770 • fax 708-298-7784

PRODUCT DATA SHEET (Rev. Mar. 95)

CORRO ULTRA-COTE (Ref. No. 103)

Product Description
Corro Ultra-Cote is a 100% solids, solvent free, low odor, novolac epoxy coating system. It's specially formulated resin produces a surface impervious to the spillage of a wide variety of acids and solvents, including Methylene Chloride and up to 98% Sulfuric Acid. Specifically formulated to resist some of the harshest chemicals, it makes for the ideal protective system for secondary containment areas.

Special Features
Corro Ultra-Cote cures to provide a hard wearing highly abrasive resistant coating with excellent chemical resistance.

Due to the blending in of special adhesion promoters Corro Ultra-Cote will adhere tenaciously to almost any clean, sound surface including damp concrete, without priming. It's low odor and no solvent smell requires no special ventilating precautions, unlike many other coating systems, resulting in less shut down time.Corro Ultra-Cote is applied and finished complete with a textured surface all in one application. With these unique characteristics and easy application techniques it makes for the ideal system for in-plant maintenance programs where protection against corrosion is of primary importance.

Optional Features
Corro Ultra-Cote is also available as a self-leveling system, Corro Ultra-Flor SL, a flooring, Corro Ultra-Flor, or as a grout for tiles, Corro Ultra-Grout. Refer to Product Data Sheets on these products.

Precautions
When working with Corro Ultra-Cote, good hygienic habits must be observed. Avoid skin contact, regular washing with warm soapy water is recommended. Long exposures to resins and hardeners may cause skin irritation, and the wearing of protective clothing and gloves is a must. Before using any of the products, please read their respective safety data sheets.

Priming
Corro Ultra-Cote is self-priming, however, priming is recommended only as a precautionary measure to try and seal the concrete to help reduce outgassing and eliminate the formation of blisters and "dry spots". However, if Corro Ultra-Cote is going to be applied over "green" concrete, then Corro-Cure (a slow set primer) must be used first. Refer to Corro-Prime data sheets.

Set Times
Corro Ultra-Cote is only available in one setting time, which is fast. Corro Ultra-Cote should be applied at a temperature between 50°F and 90°F. For temperatures lower than 50°F, please consult the factory.

Colors
Corro Ultra-Cote is supplied in the following colors: Gray, Dark Gray, Brick Red, Beige, Green and Brown. Special colors are available upon request.

Packaging and Mixing
Corro Ultra-Cote can be purchased in pre-measured 1, 2, or 3 gallon paks or 50 gallon drums. For further convenience and identification the buckets of Corro Ultra-Cote Part A and Part B will be labeled with matching Blue labels which also is the color of this product data sheet as well as the material safety data sheets. All our products will be identified by their own color coding. Corro Ultra-Cote is supplied in a user friendly mix ratio of 3:1 by volume A:B.

Clean Up
Corro Ultra-Cote while still wet can be cleaned up with a solvent, but if allowed to set then mechanical cleaning will have to be used.

Technical Assistance
With a combined total of over 180 years experience, our management team can offer unequaled design details to concrete and epoxy floors as well as installation techniques and materials designed to meet your requirements. We are prepared to assist in training your own maintenance crew in the installation of our products.

Physical Characteristics

Density (lbs./gal.)

Part A	12.3
Part B	8
Parts A & B Mixed	11.2

Mix Ratios by Volume
A : B
3 : 1

Coverage (Theoretical)
One Gallon at 10 mils = 160 sq. ft.

Pot Life at 77°F
A & B Mixed — 25 minutes

Set time at 77°F

For walking on	4 hours
Light traffic	6 hours
Maximum Chemical Resistance	7 days

Chemical Resistance (21 days immersion)

Chemical		Rating
Acetic Acid	20%	FS
	Glacial	NR
Acetone		FS
Ammonium Hydroxide		FS
Aniline		FS
Animal Fats		FS
Beer		FS
Chlorine Water	30%	FS
Chloroform		OS
Citric Acid	50%	FS
Ethyl Acetate		FS
HCL	24%	FS
	conc. (37%)	FS
Hydrogen Peroxide	10%	FS
	30%	FS
Hydrogen Sulfide		FS
Lactic Acid	20%	FS
	50%	FS
	88%	OS
Methanol		FS
Methylene Chloride		FS
MEK		FS

Chemical		Rating
Nitric Acid	10%	FS
	30%	FS
	50%	NR
Palm Kernel Oil		FS
Phosphoric Acid	30%	FS
	50%	FS
	85%	OS
Picric Acid		FS
Salt Brine Solution		FS
Sodium Hydroxide	30%	FS
	50%	FS
Sodium Hypochlorite	5%	FS
	10%	FS
	15%	FS
Sulfuric Acid	10%	FS
	50%	FS
	80%	FS
	98%	FS
Tannic Acid	50%	FS
Toluene		FS
Xylene		FS

Note: The table should be used as a guideline, as no warranty can be expressed or implied regarding the accuracy of the information given as it would apply to actual plant use. Certain chemicals will discolor the epoxy floor, however, this will in no way affect the integrity of the system.

Code: FS - Frequent Spillage
OS - Occasional Spillage
NR - Not Recommended

CORRO-SHIELD INTERNATIONAL, INC.

7047 Barry Street • Rosemont, Illinois 60018 • ☎ 708-298-7770 • fax 708-298-7784

Application Specifications for Corro Flexi-Prime and Corro-Cote

1. On uncoated concrete floors, clean by either acid etching with a 10% muriatic acid solution, followed by a neutralizing rinse, or if the concrete has a smooth power trowelled surface, then it must be abraded by lightly shot blasting or sanding. Oil saturated floors must be thoroughly cleaned with a heavy duty degreasing agent. Repeat if necessary.

2. All holes, eroded surfaces or badly pitted areas must be filled with Corro-Grout.

3. Control joints and cracks greater than 1/8" are to be filled with Corro-Grout.

4. Apply a coat of Corro Flexi-Prime to the concrete and while still wet, roll out the Corro-Mat over the primer, ensuring a complete wet out by immediately applying a second coat of Corro Flexi-Prime. Remove all trapped air bubbles by using a ribbed or porcupine roller. After wetting out the cloth, it will take on a transparent appearance. Areas showing the white of the cloth must be rolled over so as to ensure complete wet out. The Corro-mat after having been laid must be flat on the surface, and show no sign of any air bubbles. Any areas which have dried and show signs of a bubble must be cut out and reprimed and covered with the Corro-Mat.

5. After allowing the Corro Flexi-Prime to set, the area is then coated with two coats of Corro-Cote.

6. The Corro-Cote must be applied to the primer while it is still fresh or even slightly tacky. Do not allow the primer to set up hard, especially in direct sunlight. If for any reason the primer has allowed to set up hard, then it must be sanded to remove all gloss to provide a "key". The wearing of spike shoes will enable the applicator to walk on the floor if it is still tacky.

7. The first coat of Corro-Cote is applied at the rate of 160 square feet per gallon (10 mils) and is allowed to set or become tacky, thereafter, a second coat is applied at the same rate of coverage, and while it is still wet, chopped fiberglass pieces are blown or broadcast into the wet coating, to create a texture.

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Repair of Cracks and Expansion Joint

The object of this specification is to clean out and fill the cracks and then cover them with a 6" wide fiberglass cloth, impregnated with a flexible primer, and then to top coat with an epoxy coating.

SCOPE OF WORK

1. Chase open the cracks to form a V shape 3/4" wide by 1/4" deep, as well as mechanically cleaning the concrete 4" on either side of the crack.

2. Fill the crack with Corro-Grout as well as repairing any holes in the 4" strip of concrete on either side of the concrete.

3. After grouting the crack and holes, grind down any rough edges, especially those which may be left after grouting. The success of the fiberglass cloth is its ability to lay perfectly flat on the surface without any protrudances or rough edges to hinder this.

4. Allow the grout to set up to a semi-stiff or hard consistency, and then cover the crack with Corro-Mat which is 6" wide. The mat is impregnated with Corro Flexi-Prime. This is achieved by pouring the Flexi-Prime onto the mat and then spread with a trowel so as to wet out the mat until it takes on a transparent appearance.

5. While the primer is still wet, the cloth is rolled over with a ribbed or porcupine roller until all whiteness of the mat disappears.

6. After the primer has set, the area is then coated with a coat of Corro-Cote. The Corro-Cote is applied with a roller at the rate of 160 square feet per gallon.

Depending on the temperature, the Corro-Grout, Corro Flexi-Prime and Corro-Cote can be supplied in various setting times.

EXPANSION JOINT

The expansion joint is treated in the same manner as the cracks, except that the joint need not be chased open.

After cleaning, filling and covering the expansion joint with the fiberglass cloth, it is coated with Corro Ultra-Cote. The Ultra-Cote when mixed has a pot life of only twenty minutes and is applied with a roller. For convenience, the Ultra-Cote is supplied in pre-measured 1/4 gallon paks.

All Corro-Shield products are supplied in pre-measured, easy to use, convenient paks, however, if smaller amounts are required, they have easy, user friendly mix ratios of either 2:1 or 3:1 by volume. The mix ratios are printed on each bucket.

CORRO-SHIELD INTERNATIONAL, INC.
7047 Barry Street • Rosemont, Illinois 60018 • 708/296-7770 • fax 708-296-7784

PRODUCT DATA SHEET Ref. No. 607 6/94

CORRO FLEXI-PRIME

Product Description
Corro Flexi-Prime is a 100% solids, solvent free, flexible epoxy primer designed to bridge cracks and seal porous surfaces. It is specially formulated with various setting times and with virtually no odor, making it ideal for bridging cracks in concrete floors, especially floors subject to temperature changes. With its unique formula, which includes special adhesion and wetting promoters, it penetrates and tenaciously adheres to both dry as well as damp concrete and metal.

Application
Corro Flexi-Prime when used in conjunction with our Corro-Mat, a 1.5 ounce non-binder chopped strand mat fiberglass cloth, creating a reinforced flexible membrane which bridges cracks as well as help to prevent cracks from propagating through to the protective layer. By using the Corro-Flexi-Prime with the Corro-Mat a reinforced flexible membrane is created that not only helps in bridging cracks, but also helps to seal old eroded concrete or floors that have been mechanically cleaned, leaving an "open" porous surface. Priming the "open" concrete will seal the surface helping to prevent any outgassing which could create blisters in the top protective layer. Priming is also recommended to help seal the "open" concrete to help reduce the absorption of the epoxy liquids eliminating "dry" spots. Corro Flexi-Prime can be applied to 24 hour old concrete but the concrete must first be primed with our Corro-Prime S.S. (Slow Set). Vertical walls can also be protected with the Corro Flexi-Prime and Corro-Mat.

Setting Times
Corro Flexi-Prime is supplied in two setting times, either as a slow set, 83 minutes pot life, for hot conditions, or normal set, 45 minutes pot life, for ambient conditions. For temperatures below 50°F a special fast set primer can be made, please consult the factory.

Coverage
When used to wet out the Corro-Mat coverage is reduced to approximately 35 square feet per gallon.

Packaging
Corro Flexi-Prime is supplied in one gallon paks, standard paks (4 gallon) or in drum paks. The gallon and standard paks are supplied as pre-measured paks. The drum paks, however, are to be measured out. Measuring is easy because Corro Flexi-Prime is supplied in a user friendly mix ratio of 2:1 by volume of Part A to Part B. This 2:1 ratio stays the same for slow set or regular set.

Precautions
As with any epoxy avoid contact with liquids as they may cause skin irritation after prolonged use. Wear protective gloves and clothing, and practicing good hygiene is necessary. Please read the Material Safety Data Sheets before using this product.

Special Features
Corro-Mat is a non-bindered chopped strand mat and is compatible with epoxy resins. Unlike other fiberglass cloths which have binders to hold them together, Corro-Mat is stitched together. This process of manufacture allows for a complete wet out of the cloth and complete compatability with epoxy resins.

Technical Assistance
With a combined total of over 180 years experience, our management team can offer unequalled design details to concrete and epoxy floors as well as installation techniques and materials designed to meet your requirements. We are prepared to assist in training your own maintanance crew in the installation of our products.

Cleanup
Corro Flexi-Prime while still wet can be cleaned with any solvent. When dry, the primer can only be removed by mechanical means or special paint stripper.

Physical Characteristics

Solids by Weight 100%

Elongation % at 75°F 100
Elongation % at 14°F 52

Viscosity, cps 2960

Density
Part A: 8.82 lbs./gal.
Part B: 8.56 lbs./gal.
Mixed: 8.73 lbs./gal.

Full Chemical Cure: 7 days
Shelf Life: 12 months

Application Methods: Brush, Roller or Spray

Mixing Ratio:
By Volume (A:B) 2:1
By Weight (A:B) 2.1:1

Pot Life @ 75°F: 45 minutes

Thin Film Set Time: 13 hours at 75°F
33 hours at 50°F

Foot Traffic Set Time: 24 hours at 75°F
40 hours at 50°F

The data, statements and recommendations set forth in this product information sheet are based on testing, research and other development work which has been carefully conducted by us, and we believe such data, statements and recommendations will serve as reliable guidelines. However, this product is subject to numerable uses under varying conditions over which we have no control, and accordingly, we do NOT warrant that this product is suitable for any particular use. Users are advised to test the product in advance to make certain it is suitable for their particular production conditions and particular use or uses.
WARRANTY - All products manufactured by us are warranted to be first class material and free from defects in material and workmanship.
Liability under this warranty is limited to the net purchase price of any such products proven defective, or, at our option, to the repair or replacement of said products upon their return to us transportation prepaid. All claims hereunder on defective products must be made in writing within 30 days after the receipt of such products in your plant and prior to further processing or combining with other materials and products. WE MAKE NO WARRANTY, EXPRESS OR IMPLIED, AS TO THE SUITABILITY OF ANY OF OUR PRODUCTS FOR ANY PARTICULAR USE, AND WE SHALL NOT BE SUBJECT TO LIABILITY FROM ANY DAMAGES RESULTING FROM THEIR USE IN OPERATIONS NOT UNDER OUR DIRECT CONTROL.

THIS WARRANTY IS EXCLUSIVE OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, AND NO REPRESENTATIVE OF OURS OR ANY OTHER PERSON IS AUTHORIZED TO ASSUME FOR US ANY OTHER LIABILITY IN CONNECTION WITH THE SALE OF OUR PRODUCTS.

CORRO-SHIELD INTERNATIONAL, INC.

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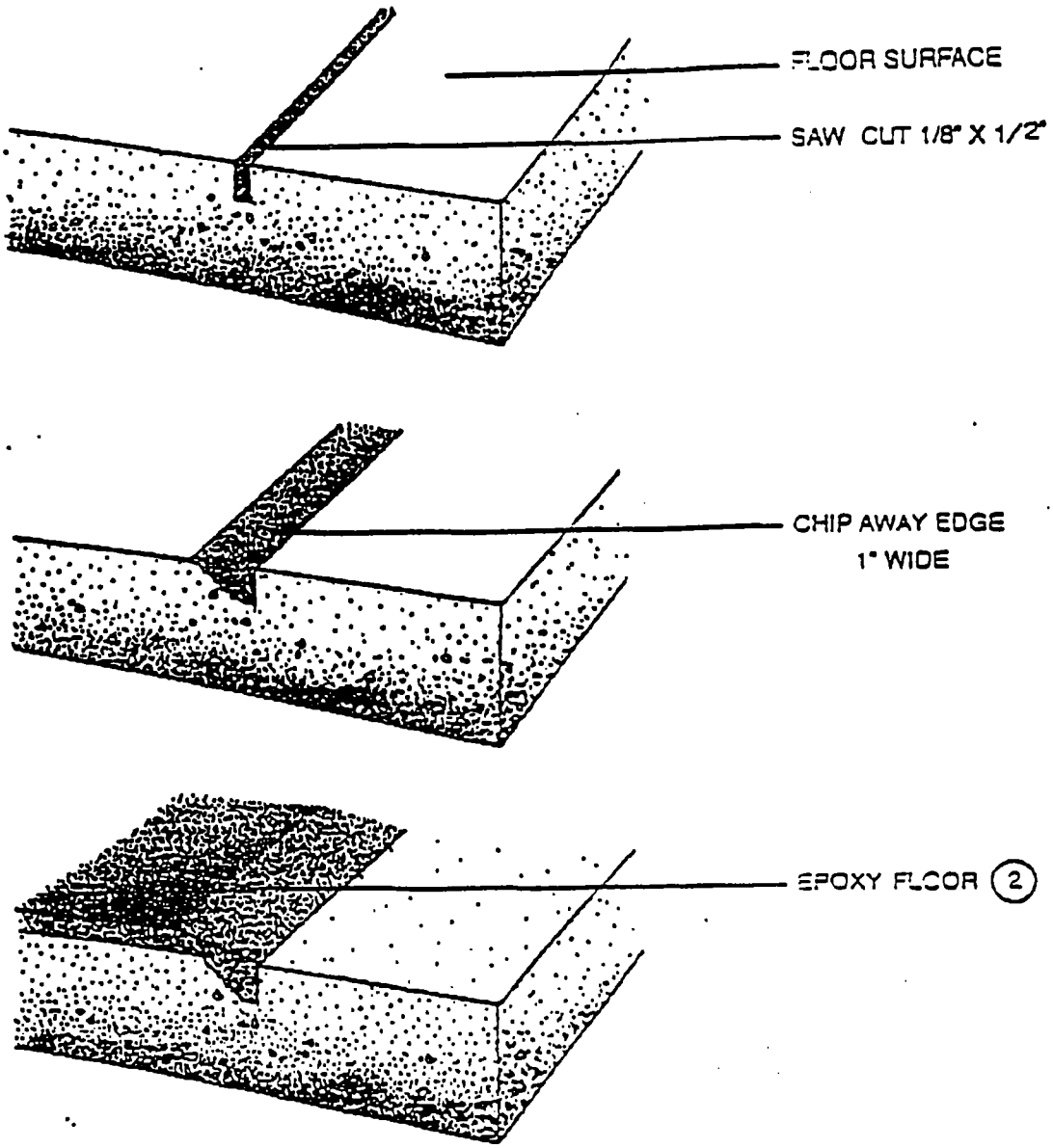
DRAWING DETAIL 1

PERIMETER KEY



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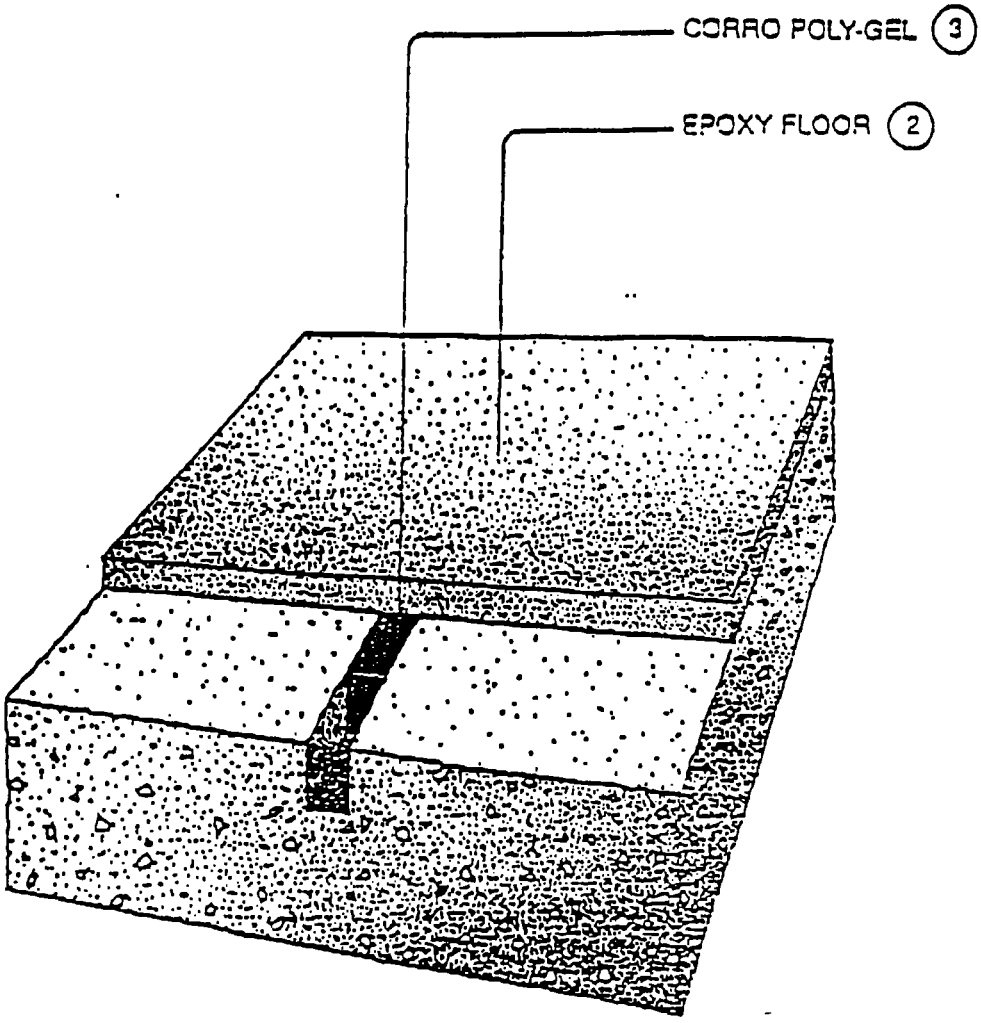
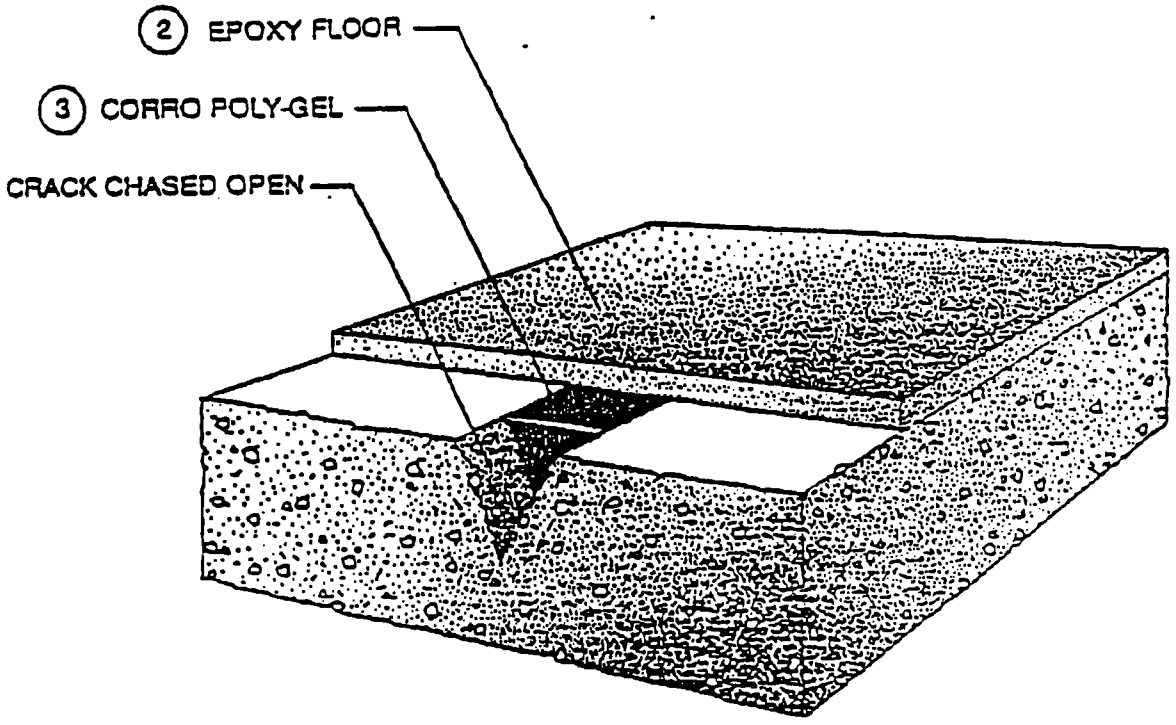


DRAWING DETAIL 2

CONTROL JOINT

CORRO-SHIELD INTERNATIONAL, INC.

7047 Barry Street • Rosemont, Illinois 60018 • ☎ 708-298-7770 • fax 708-298-7784



DRAWING DETAIL 3

CRACK REPAIR

CORRO-SHIELD INTERNATIONAL, INC.
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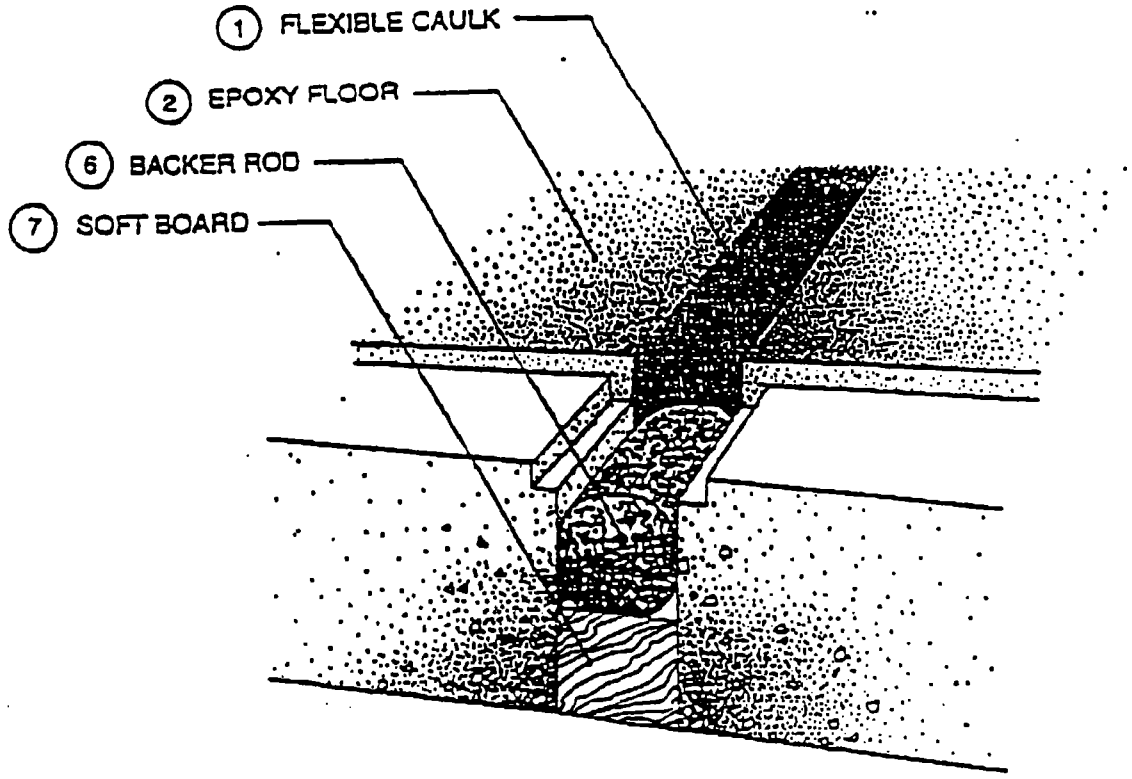

Note: The depth of the flexible caulk must never be deeper than 50% of the width

DRAWING DETAIL 4
EXPANSION JOINT

CORRO-SHIELD INTERNATIONAL, INC.

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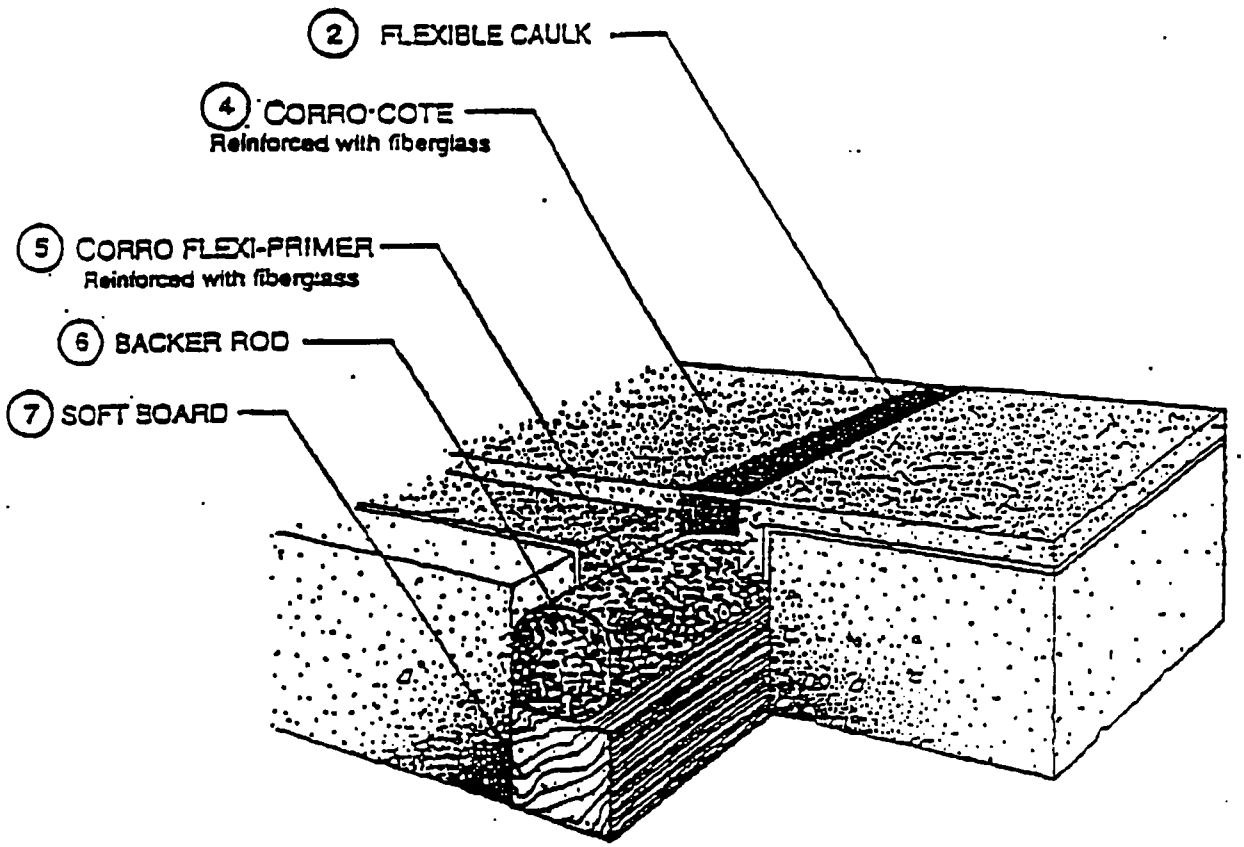

DRAWING DETAIL 4a
EXPANSION JOINT DETAIL

CORRO-SHIELD INTERNATIONAL, INC.

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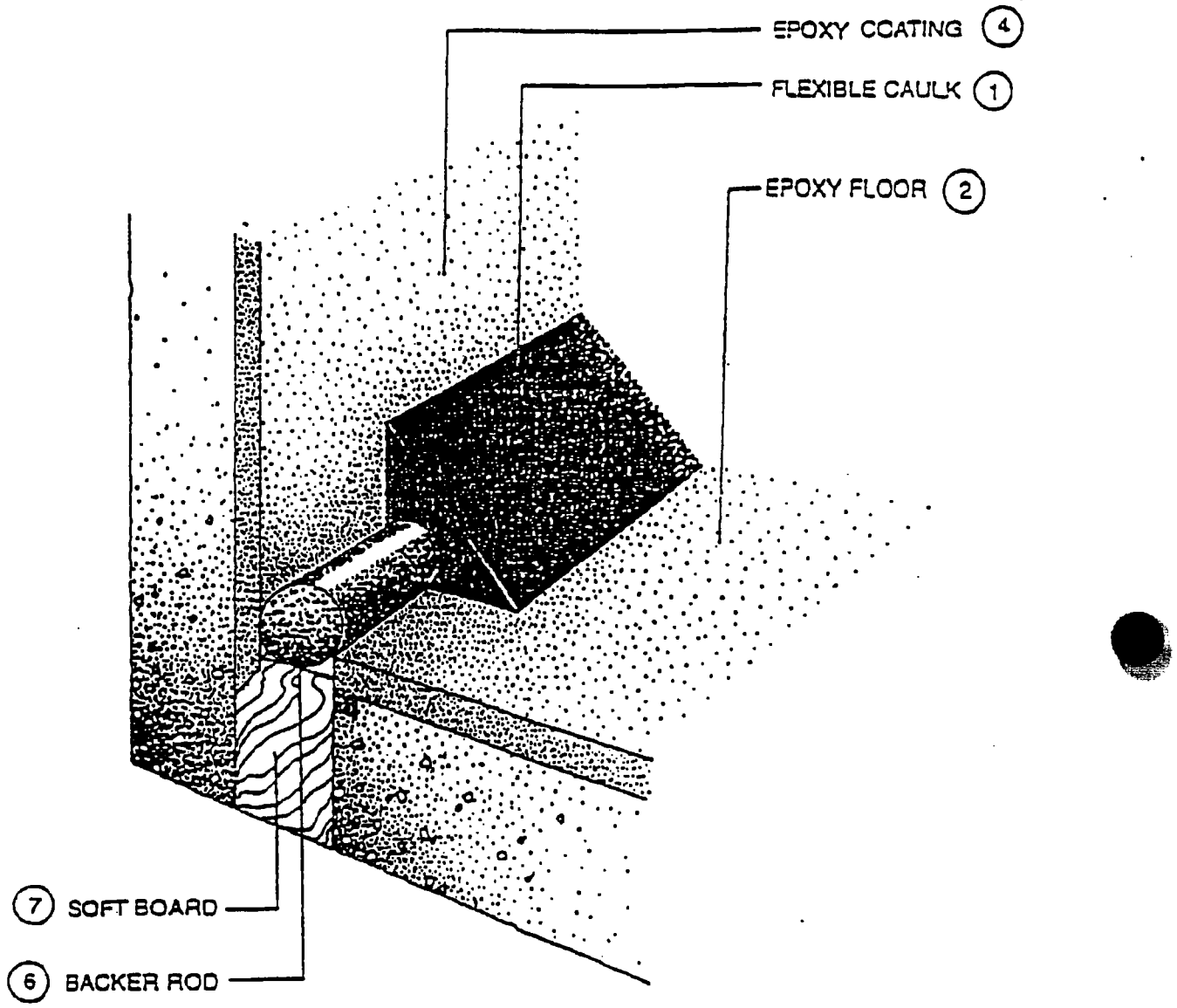
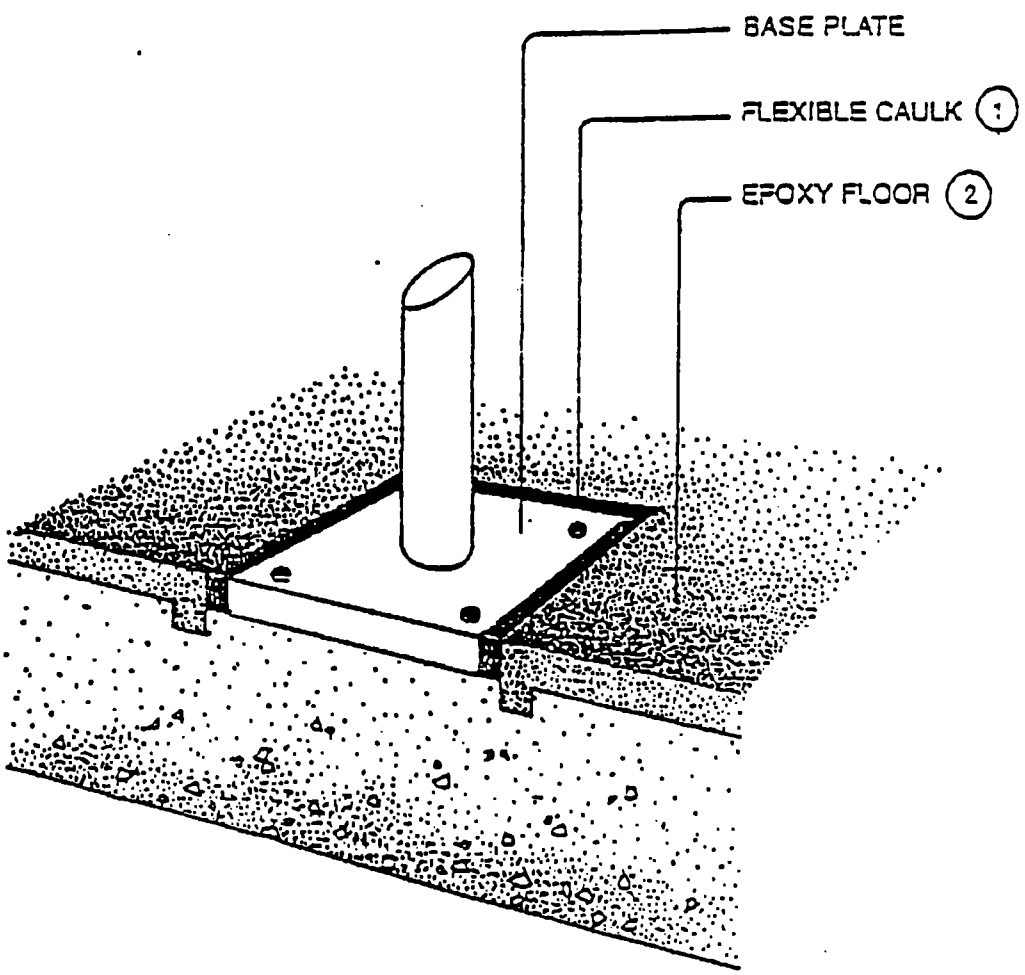


DRAWING DETAIL 5
CORNER EXPANSION JOINT

CORRO-SHIELD INTERNATIONAL, INC.

7047 Barry Street • Rosemont, Illinois 60018 • ☎ 708-298-7770 • fax 708-298-7754



DRAWING DETAIL 6

METAL BASE PLATES

CORRO-SHIELD INTERNATIONAL, INC.
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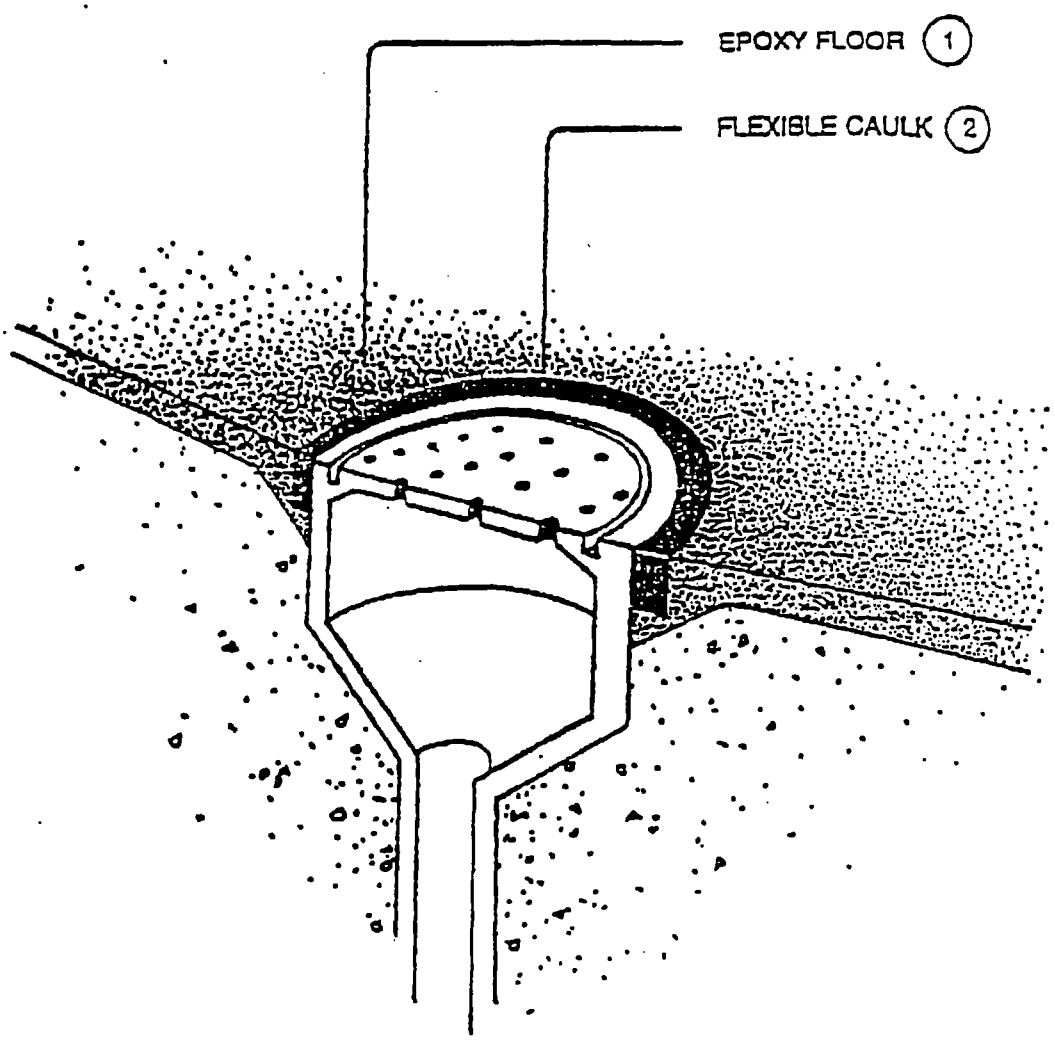
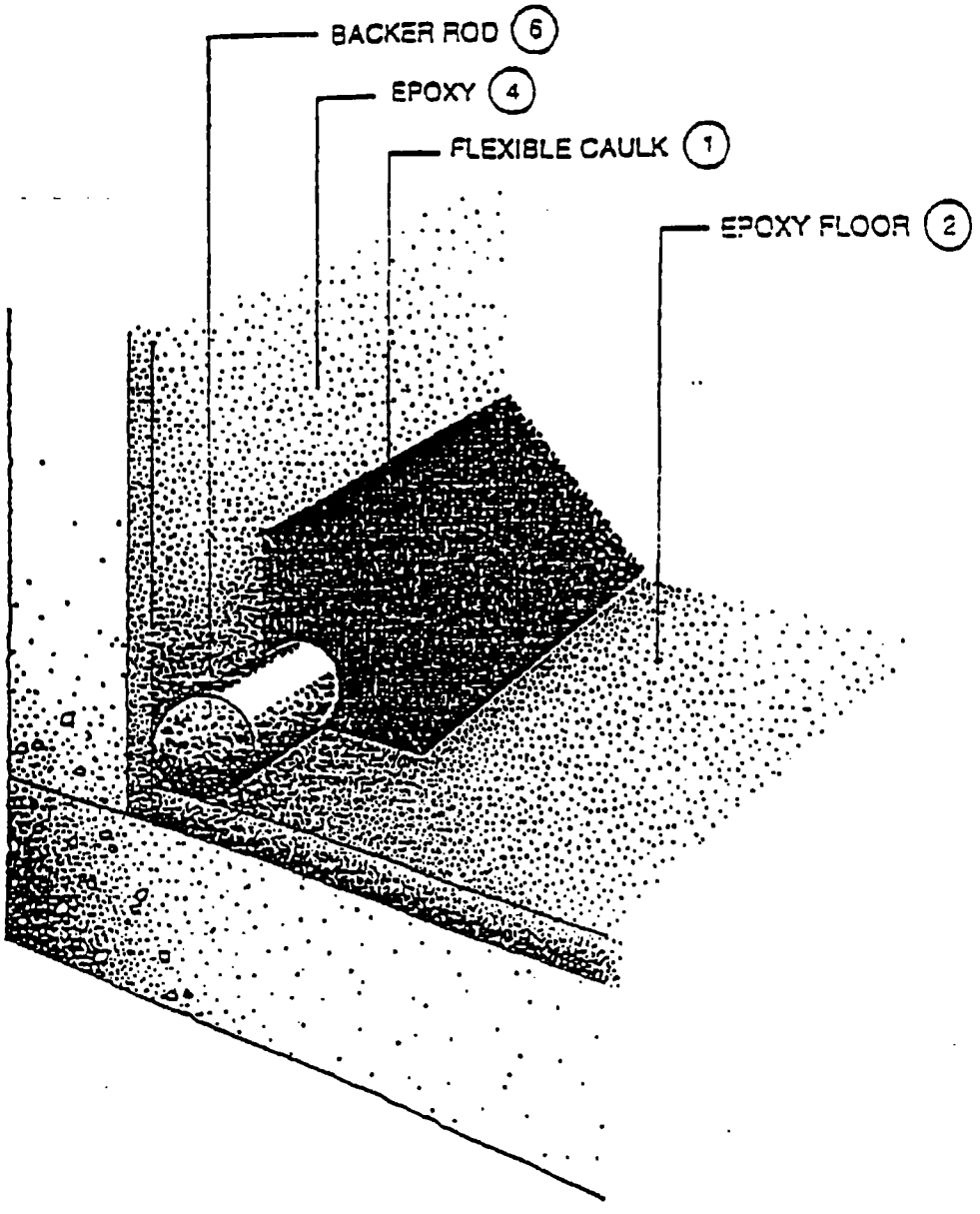


• DRAWING DETAIL 7
DRAIN

CORRO-SHIELD INTERNATIONAL, INC.

7047 Barry Street • Rosemont, Illinois 60018 • ☎ 708-298-7770 • fax 708-298-7784

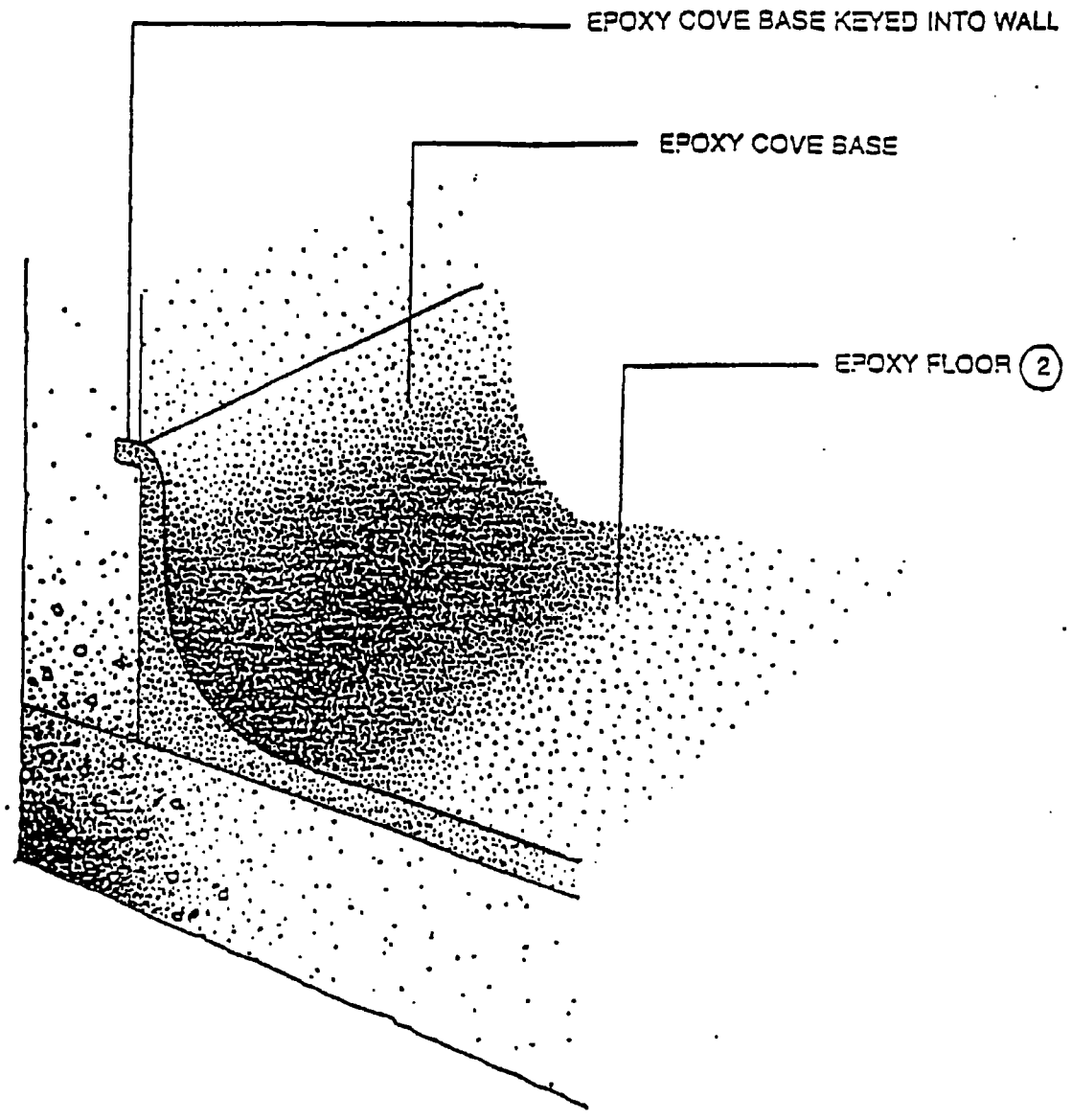


DRAWING DETAIL 8.

CORNER DETAIL – NO EXPANSION JOINT

CORRO-SHIELD INTERNATIONAL, INC.

7047 Barry Street • Rosemont, Illinois 60018 • ☎ 708-298-7770 • fax 708-298-7784

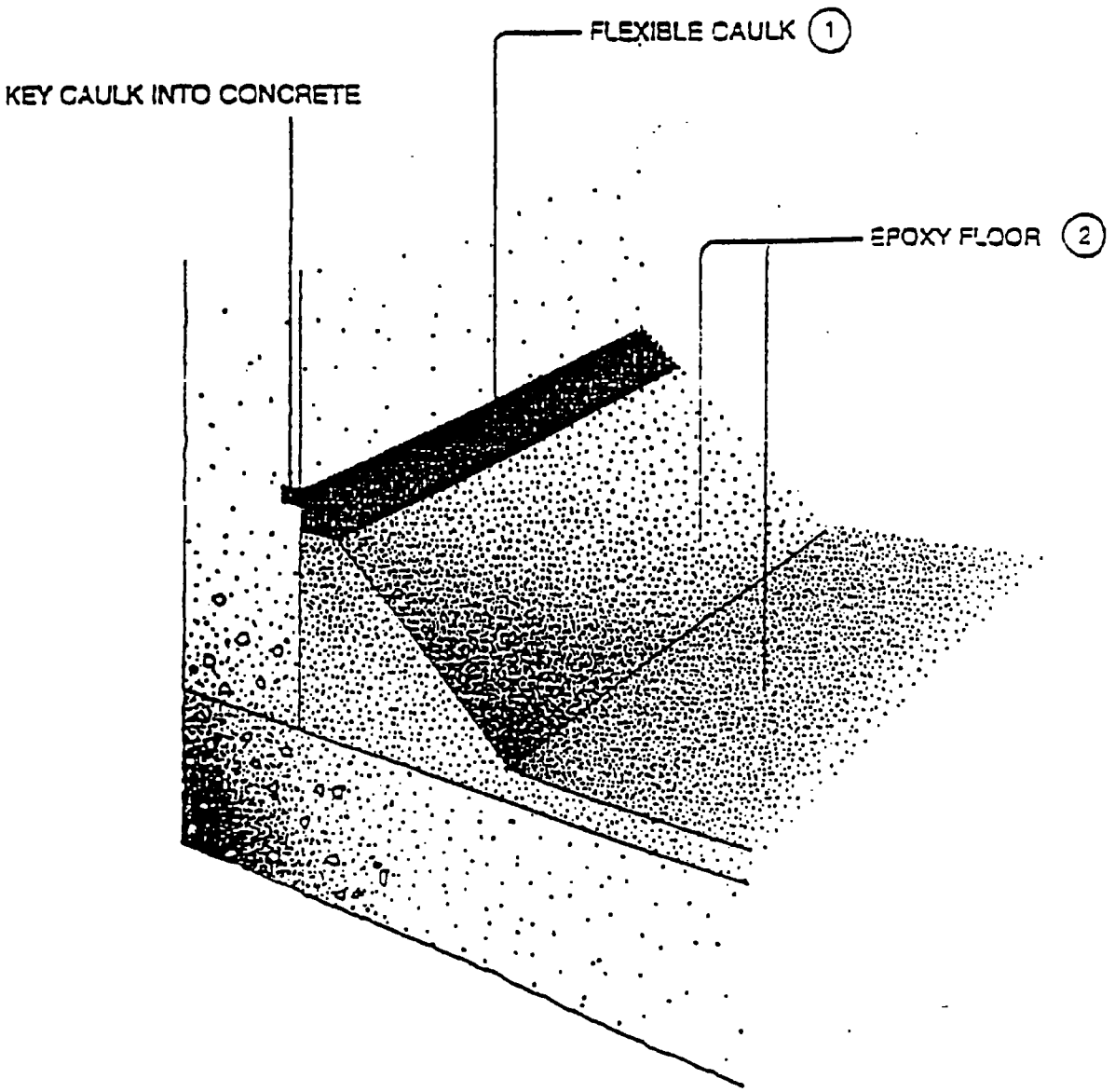


DRAWING DETAIL 9

COVE BASE

CORRO-SHIELD INTERNATIONAL, INC.

7047 Barry Street • Rosemont, Illinois 60018 • ☎ 708-298-7770 • fax 708-298-7754

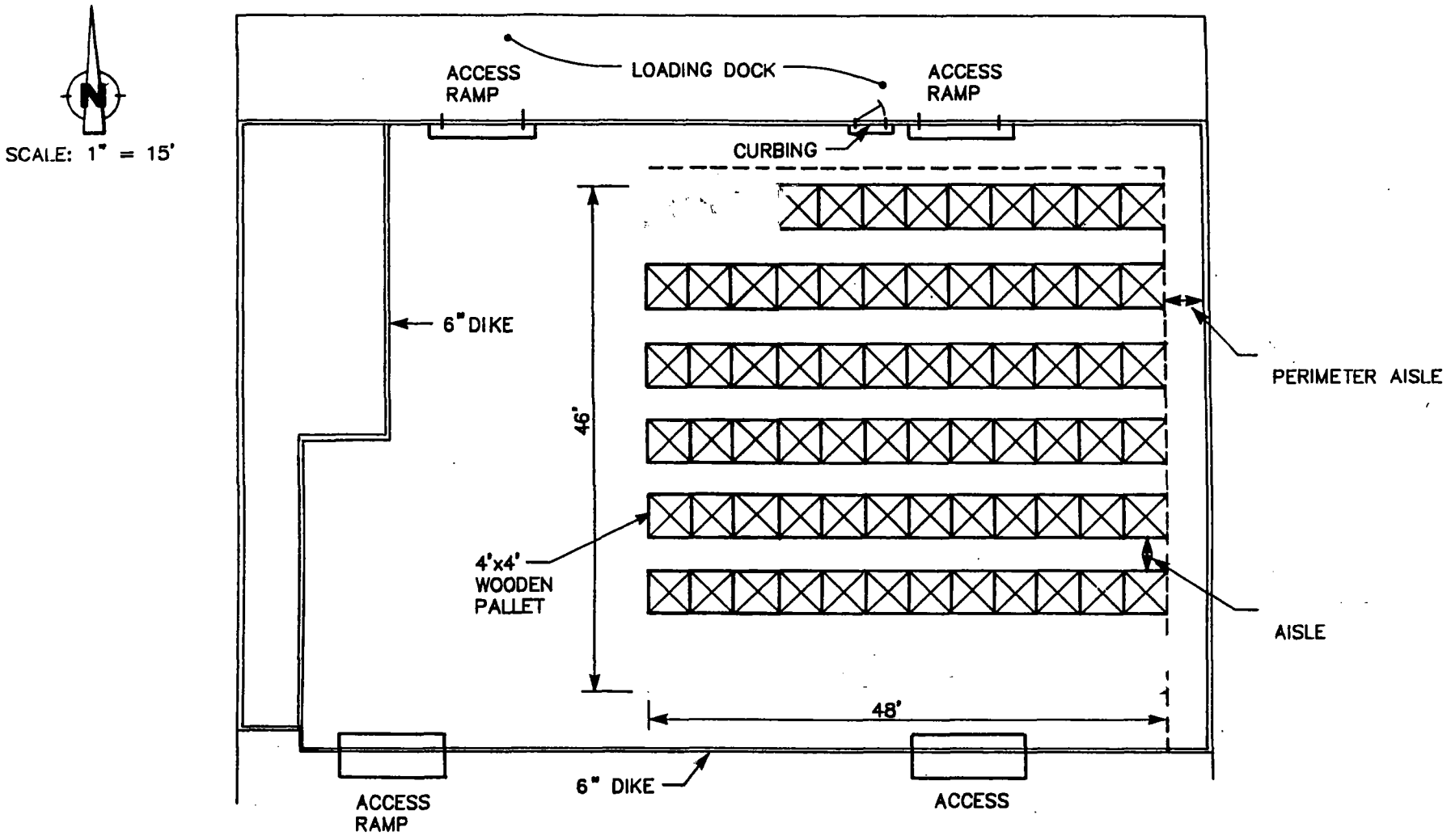


DRAWING DETAIL 10

CANT COVE BASE

ATTACHMENT D-6

SECONDARY CONTAINMENT VOLUME CALCULATIONS



TYPICAL CONTAINER ARRANGEMENT
Detrex Corporation
Melrose Park, Illinois Facility

CRA

Date: 04/30/02
Revision: 02-1
Attachment: D-5

SECONDARY CONTAINMENT VOLUME CALCULATIONS

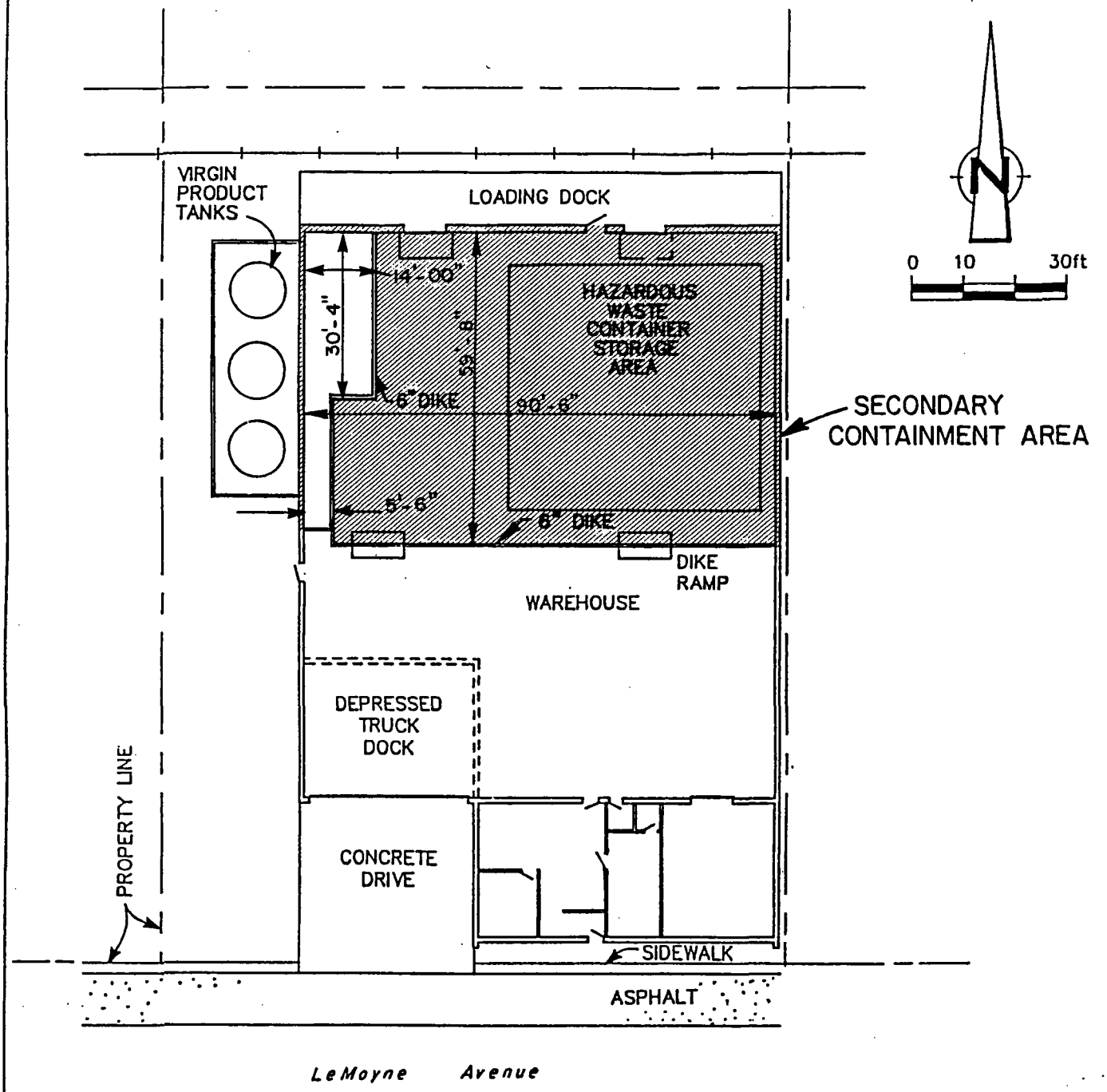
The secondary containment systems include three separate hazardous waste container storage areas. The secondary containment volume calculations for each area are provided below. **Dimensions of each area are presented on the drawings enclosed.**

Container Storage Area (6-inch high perimeter curbing)

Floor Area	=	30.33 ft x 76.5 ft +		
		29.33 ft x 85.0 ft	=	4,813.3 ft^2
		4,813.3 ft^2 x 0.5 ft high	=	2,406.6 ft^3
		2,406.6 ft^3 x 7.48 gal / ft^3	=	18,001.7
Less Miscellaneous Equipment Area (1)	=	18.001.7 x 0.1	=	1,800.2
Product & Empty Drums (300 max) (2)		300 x 11.75 gallons	=	3,525 gallons
Less Volume of Pallets (3)		40 pallets x 10.1 gallons	=	404 gallons
Less Volume of Ramps (4)		4 ramps x 60 gallons		240 gallons
TOTAL CAPACITY				**12,032.5 gallons**

Notes:

(1) For the purposes of estimating containment capacity, it is conservatively estimated that 10% of the entire floor area is covered by process equipment and miscellaneous materials.
(2) The volume of a drum below the dike is estimated at 11.75 gallons
(3) The volume of each pallet is estimated at 1.35 ft^3 = 10.1 gallons; an additional 24 pallets are included for storage of product.
(4) The volume of a 4-inch high ramp is estimated at 8 ft^3 = 60 gallons



SECONDARY CONTAINMENT SYSTEM
Detrex Corporation
Melrose Park, Illinois Facility

CRA

SECTION E

GROUNDWATER MONITORING

Detrex Corporation does not and has never had a surface impoundment, waste pile, land treatment unit or landfill. Therefore, the requirements of 35 IAC 703.185 and 724.190(b) are not applicable.

The hazardous waste container storage area, for which this Part B Permit is being applied for, is located inside a totally enclosed building. The building provides protection from precipitation and run-on into the container storage area. The building floor, which encompasses the container storage area, is constructed of concrete with concrete diking to provide secondary containment. All doorways are diked with concrete ramps. There are no floor drains or other such openings in the secondary containment area. To this point there has been no release of hazardous waste constituents to the environment from the solid waste management units at the facility. Detrex will continue to operate and maintain the secondary containment area to prevent hazardous waste or hazardous waste constituents from escaping into the environment in a manner that could directly or indirectly impact the groundwater.

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SECTION F

TABLE OF CONTENTS

LIST OF ATTACHMENTS

SECTION F

PROCEDURES TO PREVENT HAZARDS

This section of this RCRA Part B Permit Application provides a description of the procedures implemented at the Detrex Corporation Solvents facility to prevent the possibility of a hazard from occurring.

This information is provided pursuant to Illinois Rule 35. The applicable sections of the Illinois Regulations are referenced as appropriate.

F-1 SECURITY
[35 IAC 703.183(d), 724.114, 40 CFR 264.14, 270.14(B)(4)]

F-1a Security Procedures and Equipment
[35 IAC 703.183(d), 724.114, 40 CFR 270.14(B)(4), 264.14]

F-1a(1) 24-Hour Surveillance System
[35 IAC 703.183(a), 40 CFR 264.14(b)(1)]

All hazardous waste activities are performed within a single secure building and as such does not require the use of a 24-hour surveillance system. A 24-hour electronic surveillance system is present at the Detrex facility in Melrose Park, Illinois. The surveillance system consists of the following:

- One four zone alarm control panel;
- One 30 watt indoor electronic siren;
- One central station alarm transmitter;
- One touch pad set station;
- One entry delay warning sounder;
- Contact one front door;
- One ultra sonic motion detector in office; and
- One infrared photo electric eye across rear wall (east to west)

F-1a(2)(a) Barrier
[35 IAC 724.114(b)(2)(4), 40 CFR 264.14(b)(2)(i)]

The entire hazardous waste treatment operation and storage area is located within a single-story concrete block building. The building is provided with security doors, which are kept locked at all times when the facility is unattended. The security procedures prevent the entry of unauthorized persons or livestock into the active portion of the hazardous waste handling area. Security precautions are illustrated in Attachment F-1.

F-1a(2)(b) Means to Control Entry
[35 IAC 724.114(b)(2)(B), 40 CFR 264.14(b)(ii)]

As described above, the entire hazardous waste handling area is contained within a single building. The entrances to the building are controlled by security doors which are kept locked when the facility is unattended and an electronic surveillance system is present to prevent access to the active portions of the facility at all times to all except authorized persons.

During normal business hours, office personnel are available to maintain records of visitors, including other Detrex employees who do not work at this office; this is

accomplished through a sign-in log in which visitors are required to denote their arrival and departure times. Since the container storage areas and the distillation units are located inside the building, unauthorized personnel can not gain access to hazardous waste areas without the knowledge of office personnel.

F-1a(3) Warning Signs [35 IAC 724.114]
[40 CFR 264.14(c)]

Warning signs are posted on the outside wall of the building wherever an access door is located. The signs are legible from a distance of 25 feet and have the following wording:

"Danger - Unauthorized Personnel Keep Out".

F-1b Waiver [35 IAC 724.114(a)]
[40 CFR 264.14(a)]

The security precautions noted above are considered to be sufficient to prevent unauthorized access to hazardous waste management areas. The facility is provided with a physical barrier and a means to control entry. Therefore, Detrex Corporation does not request a waiver from the security procedures and equipment requirements of the permit application for the facility in Melrose Park, Illinois.

F-2 INSPECTION SCHEDULE
[35 IAC 703.183(e), 724.115, 40 CFR 270.15, 270.14(B)(5)]

F-2a General Inspection Requirements
[35 IAC 703.183(e), 724.115(a) and 724.113, 40 CFR 270.14(b)(5), 264.15(a) and (b), 264.33]

Detrex conducts regular (daily and weekly) inspections of the hazardous waste container storage area for leaking containers and for deterioration of containers and the containment system that could cause or lead to the release of hazardous waste constituents to the environment or threaten human health.

The hazardous waste container storage area is contained within a single 'warehouse' type building. This allows an almost continual check by on-site staff and rapid detection and response to any problems.

F-2a(1)Types of Problems [35 IAC 724.115(b)(3)]
[40 CFR 264.15(b)(3)]

Based on the nature of the equipment utilized at the facility, the primary concern is the occurrence of leaks and/or spills. Inspection schedules for monitoring secondary containment areas and loading and unloading areas were developed with the goal of promptly identifying leaks or spills, or equipment problems. Safety and emergency equipment inspection schedules include troubleshooting concerns associated with the equipment. As such each item of emergency equipment will be checked. For example, the phone system will be checked to insure that outside lines work; and emergency lighting, to insure that the battery is holding a charge. Other items are checked to insure that they are present and in good working order.

Attachment F-2 presents the typical schedule for inspecting security, emergency equipment and the hazardous waste container storage area. Copies of the inspection schedule are kept on file at the facility at all times.

F-2a(2) Frequency of Inspection
[35 IAC 724.115(b)(4), 40 CFR 264.15(b)(4)]

Attachment F-2 also includes the frequency of inspection for each item. The frequency of inspection is based on:

1. The probable deterioration of equipment based on use and handling;
2. The probability of equipment deterioration or operator error resulting in an incident which is harmful to human health or the environment, and
3. Regulatory requirements.

F-2a(3) Remedial Action

Inspections may reveal problems of three types. The first type of problem involves the need for non-emergency maintenance. In this situation, qualified personnel will take the necessary actions as soon as possible to preclude further damage and reduce the potential for emergency repairs. The inspector will note in the inspection log when such action should be taken and verify the status on the next regularly scheduled inspection.

The second type of problem involves a non-emergency release of hazardous waste that is discovered during inspection. In this situation, appropriate remedial action will be taken immediately and documented in the inspection log. At a minimum, daily inspections will be made until the remedial action is completed.

The third type of problem involves the discovery of a release or the potential for the release of hazardous constituents to the environment in sufficient quantities to constitute an emergency. If this occurs, the Contingency Plan (included as Section G of this permit application) will be implemented. The Contingency Plan provides a detailed description of the remedial action appropriate for this situation.

F2a(4) Inspection Log

Provided in Attachment F-3 are typical daily and weekly inspection records. These are completed by the inspector at the conclusion of each routine inspection. Each inspection record is kept on file in an inspection log for a minimum of three years.

F-2b Specific Process Inspection Requirements
[40 CFR 270.14(b)(5), 264.15(b)(4)]

The following sections outline specific inspection requirements.

F-2b(1) Container Inspection
[724.274, 40 CFR 264.174]

The Detrex containers and container storage area are inspected on a daily basis as indicated in the hazardous waste inspection schedule presented in Attachment F-2. The daily inspection includes leaking or open containers, visible and proper labels, accumulation dates, adequate aisle space and total inventory. The containment structure is inspected at minimum weekly for presence of liquids or visible cracks.

F-2b(2) Tank System Inspection
[724.294(a) and (b), 40 CFR 264.195]

Detrex Corporation does not operate a hazardous waste storage tank at the facility in Melrose Park, Illinois.

F-2b(3) Waste Pile Liner Inspection for Exemption from Groundwater Protection Requirement
[35 IAC 703.204(d), 724.353(a)(3)]

Detrex Corporation does not and has never had a waste pile at the facility in Melrose Park, Illinois.

F-2b(4)Waste Pile Inspection [35 IAC 724.354(b)]
[40 CFR 270.18(d), 264.254(b)]

Detrex Corporation does not and has never had a waste pile at the facility in

Melrose Park, Illinois.

F-2b(5) Surface Impoundment Inspection
[35 IAC 724.326(b) and (c), 40 CFR 270.17(c), 264.226(b), 264.226(c)]

Detrex Corporation does not and has never had a surface impoundment at the facility in Melrose Park, Illinois.

F-2b(6) Incinerator Inspection
[35 IAC 724.447, 40 CFR 264.347(b)]

Detrex Corporation does not and has never had an incinerator at the facility in Melrose Park, Illinois.

F-2b(7) Landfill Inspection
[35 IAC 724.403(b), 40 CFR 264.303(b)]

Detrex Corporation does not and has never had a landfill at the facility in Melrose Park, Illinois.

F-2b(8) Land Treatment Facility Inspection
[35 IAC 724.373(g), 40 CFR 264.273(g)]

Detrex Corporation does not and has never had a land treatment facility at the facility in Melrose Park, Illinois.

F-2b(8) Miscellaneous Unit Inspections
[40 CFR 270.14(b)(5), 264.602

This section not applicable to this facility.

F-2b(9) Boilers and Industrial Furnaces (BIF) Inspections
[40 CFR 264.15, 266.102(a)(2)(ii), 266.102(e)(8), 266.111(e)(3)]

This section not applicable to this facility.

F-2b(10) Containment Building Inspection
[40 CFR 264.1101(c)(3), 264.1101(c)(4)]

This section not applicable to this facility. Notwithstanding this, the entire hazardous waste management area of the building is inspected on a regular basis.

F-3 PREPAREDNESS AND PREVENTION

[40 CFR 270.14(B), 264.32(A) THROUGH 264.32(D)]

The applicant does not wish to request a waiver of the preparedness and prevention requirements of the permit application. These requirements are also addressed in the contingency plan found in Section G of this application.

Melrose Park Fire Department (MPFD) and Police Officials are familiar with the hazardous waste management operation and with the contingency plan for the facility. A copy of the contingency plan will be kept in the facility office at all times.

F-3a Equipment Requirements

[35 IAC 703.183, 724.132, [40 CFR 270.14(B), 264.32]

F-3a(1) Internal/External Communications

[35 IAC 724.132(a) and (b), 40 CFR 264.32(a)], [40 CFR 264.32(b)]

There is a telephone located within the hazardous waste treatment area. This telephone can be actuated internally as a public address (P.A.) system to warn employees of potential hazards and externally to alert local emergency response teams (e.g., fire, ambulance, police). There are also five other telephone units throughout the facility. Each phone unit can be actuated as the P.A. system. All telephone locations are shown on Attachment F-4.

F-3a(2) Emergency Equipment

[35 IAC 724.132(c), 40 CFR 264.32(c)]

Attachment F-4 to this permit application presents the location of all emergency and safety equipment within the facility.

All emergency and safety equipment is routinely inspected and tested in accordance with the inspection schedule presented in Section F-2 to ensure its readiness for proper operation in time of emergency.

Decontamination of equipment after use will depend upon the type of equipment. The supplies used in decontamination will be purchased or obtained as needed. Many of the items and supplies (brushes, soap, buckets) will be available from local stores;

decontamination of larger equipment may be contracted out to local emergency response agencies that have the equipment necessary to perform larger decontamination jobs.

F-3a(3) Water for Fire Control
[35 IAC 724.132(d), 40 CFR 264.32(d)]

The nearest fire hydrant to the facility is located on LeMoyne Avenue directly in front of the facility. The available water pressure in this watermain (measured in 1992) was approximately 37-38 psi.

F-3b Aisle Space Requirement
[35 IAC 724.135, 40 CFR 264.35]

The aisle space requirement is met by maintaining a minimum of 30-inch aisles in the hazardous waste container storage area. This allows detection of spill material and the unobstructed movement of personnel, fire protection equipment, spill control equipment, and material handling equipment.

F-4 PREVENTIVE PROCEDURES, STRUCTURES AND EQUIPMENT
[35 IAC 703.183(h), 40 CFR 270.14(B)(8)]

F-4a Unloading Operations
[35 IAC 703.183(h)(1), 40 CFR 270.14(B)(8)(I)]

Hazardous waste loading/unloading operations, associated with the container storage area, consists of forklift or hand drum truck movement of drums to and from the container storage area. The forklift is equipped with a special drum handling attachment.

The unloading of hazardous waste occurs at the depressed truck dock in the receiving area on the south-west corner of the facility. The delivery truck backs up to the raised loading/unloading area. This area is entirely within the building structure. The containers are loaded/unloaded using a forklift or hand drum truck and transferred to the staging area pending analytical results.

All loading/unloading operations are conducted under the supervision of Detrex personnel and the area is inspected at the conclusion of unloading operations to ensure that no spillage has occurred.

F-4b Runoff
[35 IAC 703.183(h)(2), 40 CFR 270.14(b)(8)(ii)]

The hazardous waste storage and treatment areas are located within an enclosed building. This prevents accumulation of run-on waters in the hazardous waste handling areas. As indicated in Section B of this permit application, the area immediately surrounding the warehouse is sloped away from the building except for the concrete driveway. The driveway slopes down toward the facility to a catchbasin which discharges to the 18-inch diameter combined sewer in front of the facility.

During all loading/unloading operations, a 1/4-inch thick polypropylene pad is placed over the catchbasin cover. This pad prevents potentially spilled liquids from entering the sewer.

F-4c Water Supplies
[35 IAC 703.183(h)(3), 40 CFR 270.14(b)(8)(iii)]

All water at this facility is received from the municipal water main previously noted in Section B-2a(9) and F-3a(4). Contamination of the water supply is not possible since the secondary containment systems will hold all leaks or spills at the facility, and thus will not come into contact with the water supply.

F-4d Equipment and Power Failure[35 IAC 703.183(h)(4), 40 CFR 270.14(B)(8)(IV)]

In the event of a power failure, plant operations will stop. There is no electrically-powered equipment involved in the operation of the hazardous waste container storage system.

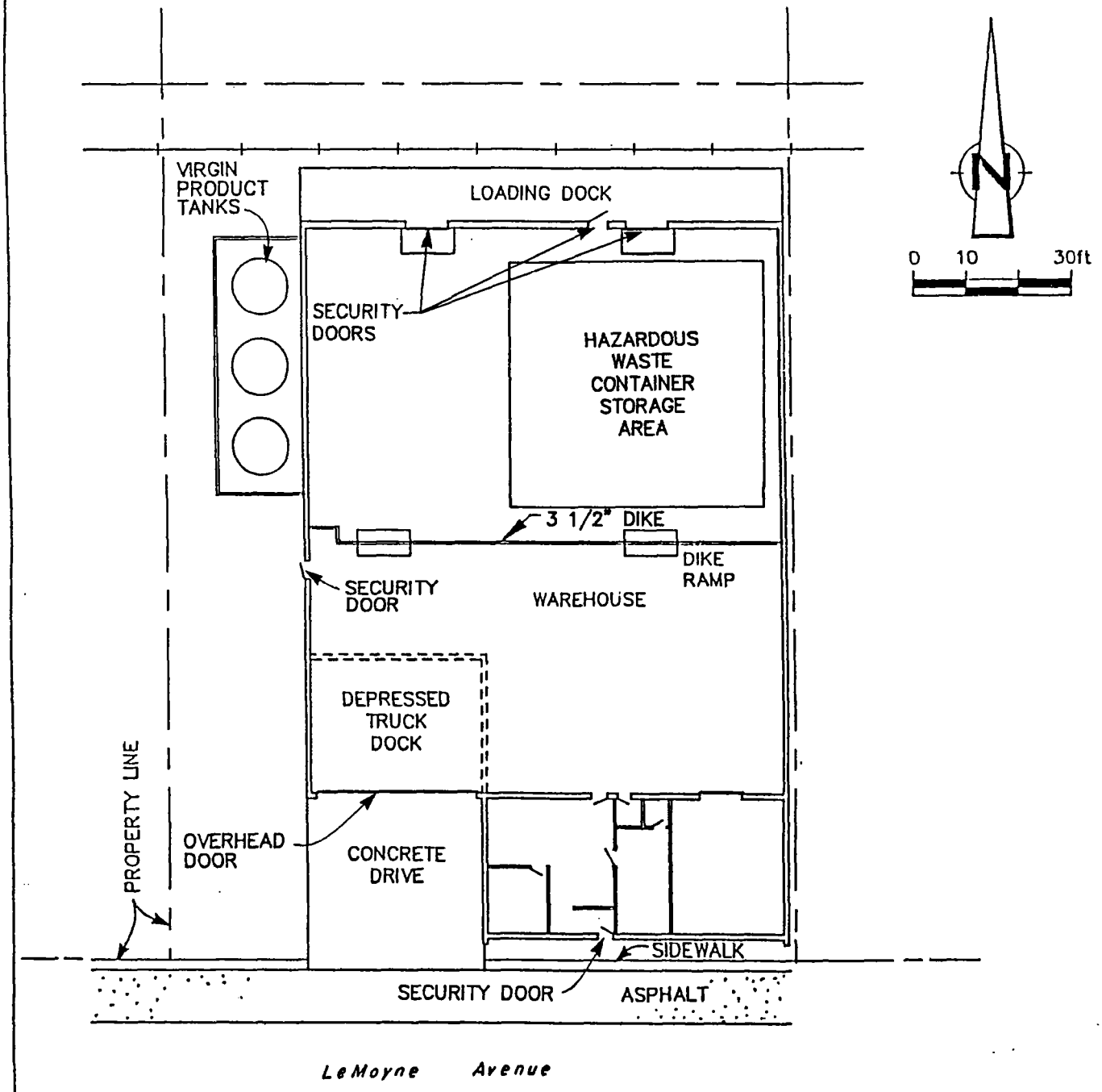
F-4e Personnel Protection Equipment
[35 IAC 703.183(h)(5), 40 CFR 270.14(B)(8)(V)]

The personnel protection equipment provided at the facility is listed in Section F-3a(2). Section G-5 of the Contingency Plan describes the equipment and its capabilities and locations in the facility. The proper use of the appropriate equipment is explained during personnel training procedures as described in Section H of this permit application. Generally, the only time in which personnel protective equipment is required during normal operating conditions is during drum sampling. Sampling personnel are required to wear rubber gloves to prevent contact of hazardous waste liquids with the skin. During any cleanup of spilled liquids, personnel are also required to wear other Personnel Protective Equipment such as rubber boots.

F-5 MANAGEMENT OF IGNITABLE, REACTIVE, AND INCOMPATIBLE WASTES

[40 CFR 270.14(b)(9)]

There are no ignitable, reactive, or incompatible wastes stored in the container storage area; hence, a permit for the handling of ignitable, reactive, and incompatible wastes is not requested.



NOTE:

1. ALL DOORS REMAIN LOCKED WHEN FACILITY IS UNATTENDED
2. DUPAGE ELECTRONIC SECURITY SYSTEM ALSO PRESENT

SECURITY PRECAUTIONS
Detrex Corporation
Melrose Park, Illinois Facility

CRA

Date: 04/30/02
Revision: 02-1

Attachment F-2
HAZARDOUS WASTE INSPECTION SCHEDULE

Items	*Type of Problem*	*Inspection Frequency*
Hazardous waste container storage area	- Leaking containers - Bungs properly secured - Corrosion on containers - Proper stack height - Proper labeling/marking - Adequate Aisle space - Accumulation date on containers	Daily
Secondary Containment	- Base free of cracks and intact - Presence of Free Liquid	Weekly
Loading/unloading area	- Spills - Drain cover	Daily
Container handling equipment (fork lift, pallet jack, drum hand cart)	- Available & Operational	Daily, when used
Absorbent material	- Adequate supply	Weekly
Barriers to prevent entry		
Doors	- Open freely - Locks function	Daily
Signs	- Present	Weekly
Fences	- Intact	Weekly
Personnel Protective Equipment (gloves, aprons, goggles, face shields)	- Adequate supply	Weekly
Fire Protection- Extinguisher	- Available - Loss of pressure	Weekly
Eye wash station/ safety shower	- Functions - Scale or rust in water	Weekly
First Aid Kit	- Available - Adequate supplies	Weekly
Communication equipment		
Telephones	- Operational	Weekly
Intercom and/or 2-way radios	- Operational/available	Weekly
Alarm Systems	- Operational	Monthly

BRANCH LOCATION: _____ WEEK ENDING: _____

FACILITY DAILY INSPECTION FORM

INDICATE CONDITIONS

INSPECTION ITEM	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
Hazardous Waste Container Storage Area					
Loading / Unloading Area					
Container Handling Equipment					
Barriers to prevent entry					
Signature					
Date					
Time					

Comments concerning problems or potential problems (include: date, time, and nature of repairs or remedial actions taken to mitigate problems):

NOTE: REFER TO HAZARDOUS WASTE INSPECTION SCHEDULE FOR DETAILS ON TYPES OF PROBLEMS WHICH MAY BE ENCOUNTERED

HAZARDOUS WASTE INSPECTION SCHEDULE

Items	*Type of Problem*	*Inspection Frequency*
Hazardous waste container storage area	- Base free of cracks and intact - Presence of Free Liquid	Weekly
Absorbent material	- Adequate supply	Weekly
Barriers to prevent entry		
Signs	- Present	Weekly
Fences	- Intact	Weekly
Personnel Protective Equipment (gloves, aprons, goggles, face shields)	- Adequate supply	Weekly
Fire Protection-		
Extinguisher	- Available - Loss of pressure	Weekly
Eye wash station/ safety shower	- Functions - Scale or rust in water	Weekly
First Aid Kit	- Available - Adequate supplies	Weekly
Communication equipment		
Telephones	- Operational	Weekly
Intercom and/or 2-way radios	- Operational/available	Weekly

Alarm Systems - Operational *Monthly*

BRANCH LOCATION: _____ WEEK ENDING: _____

FACILITY WEEKLY INSPECTION FORM

INDICATE CONDITIONS

Equipment to inspect	possible problems	status / condition
Secondary Containment	Intact and Operational	
Absorbent Material	Quantity and availability	
Barriers to prevent entry	Intact and Operational	
Personnel Protective Equipment	Quantity and availability	
Fire Protection	Quantity and availability	
Eye Wash / Safety Showers	Quantity and availability	
First Aid Kit	Quantity and availability	
Communication Equipment	Quantity and availability	
Alarm Systems	Intact and Operational	
Signature, Date, Time		

Comments concerning problems or potential problems (include: date, time, and nature of repairs or remedial actions taken to mitigate problems):

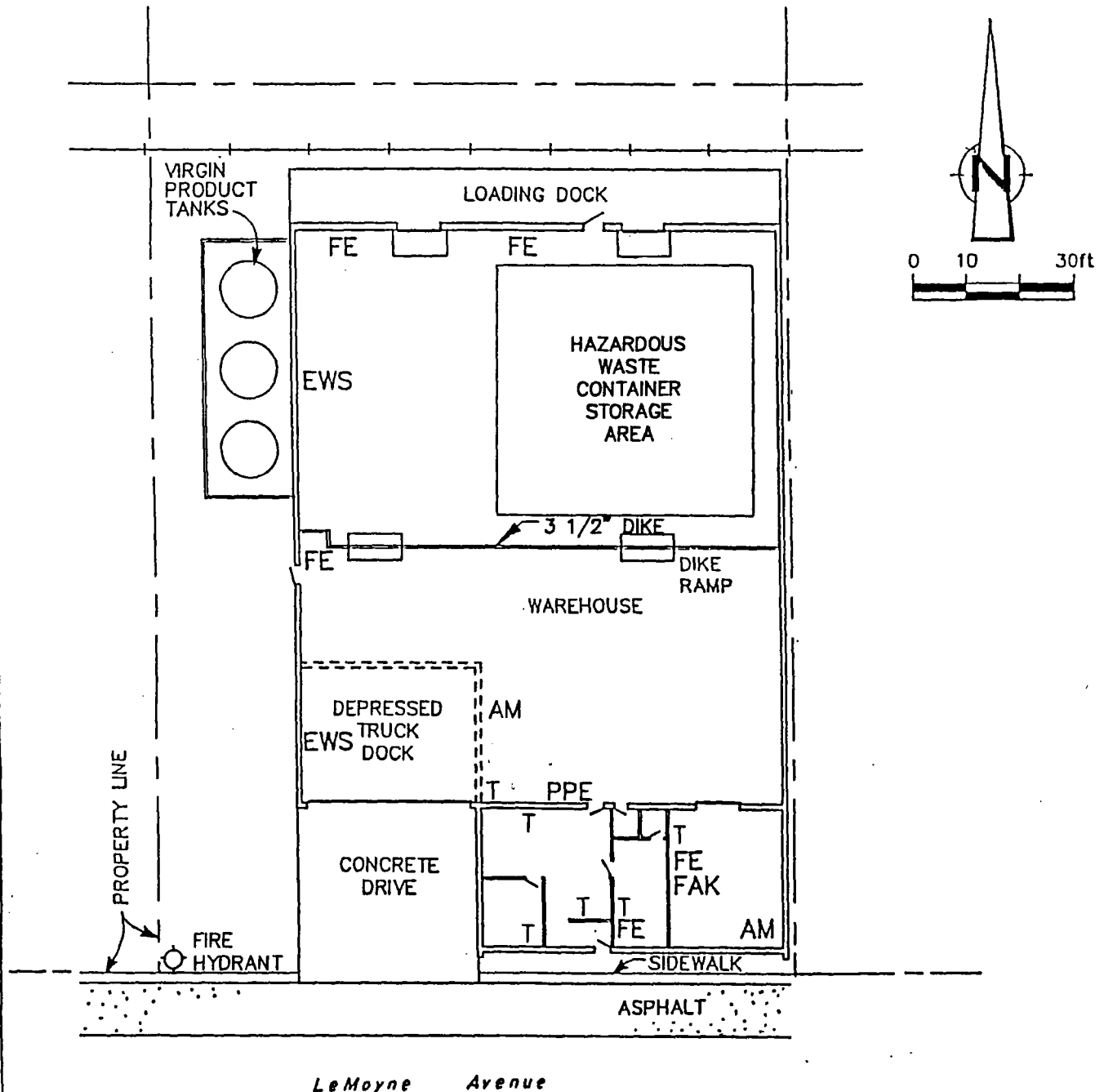
NOTE: REFER TO HAZARDOUS WASTE INSPECTION SCHEDULE FOR GREATER DETAILS ON TYPES OF PROBLEMS WHICH MAY BE ENCOUNTERED

HAZARDOUS WASTE INSPECTION SCHEDULE

Items	*Type of Problem*	*Inspection Frequency*
Hazardous waste container storage area	- Base free of cracks and intact - Presence of Free Liquid	Weekly
Absorbent material	- Adequate supply	Weekly
Barriers to prevent entry		
Signs	- Present	Weekly
Fences	- Intact	Weekly
Personnel Protective Equipment (gloves, aprons, goggles, face shields)	- Adequate supply	Weekly
Fire Protection-		
Extinguisher	- Available - Loss of pressure	Weekly
Eye wash station/ safety shower	- Functions - Scale or rust in water	Weekly
First Aid Kit	- Available - Adequate supplies	Weekly
Communication equipment		
Telephones	- Operational	Weekly
Intercom and/or 2-way radios	- Operational/available	Weekly
Alarm Systems	- Operational	

ATTACHMENT F-4

LOCATION OF EMERGENCY AND SAFETY EQUIPMENT



LEGEND

AM – ABSORBENT MATERIAL
EWS – EYE WASH STATION
FAK – FIRST AID KIT
FE – FIRE EXTINGUISHER

T – TELEPHONE/P.A. SYSTEM
PPE – PERSONNEL PROTECTIVE EQUIPMENT (GLOVES, GOGGLES/FACE SHIELDS, BOOTS)

LOCATION OF EMERGENCY AND SAFETY EQUIPMENT

Detrex Corporation

Melrose Park, Illinois Facility

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SECTON G

CONTINGENCY PLAN

Illinois Rule 35 IAC 703.183(g), 724.150 through 724.156, 724.152(b)
[40 CFR 270.149(b)(7), 264.50 through 264.56, 264.52(b)]

This Contingency Plan has been prepared for the Detrex Corporation Facility (Facility) located in Melrose Park, Illinois. The Contingency Plan (CP) has been designed to minimize hazards to human health or the environment and describes the actions Facility personnel will take in response to fires, explosions, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents at the Facility.

The information is provided pursuant to Illinois Rule 35 IAC 703.183(g), 724.150 through 724.156, 724.152(b). The applicable section(s) of the Illinois regulations are referenced as appropriate.

G-1 GENERAL INFORMATION

This CP has been provided for the Treatment Storage and Disposal Facility (TSDF) owned and operated by Detrex Corporation at the following location:

2537 LeMoyne Avenue
Melrose Park, Illinois
U.S.A. 60160

This Facility is owned and operated by Detrex Corporation warehousing both virgin and hazardous waste halogenated hydrocarbon solvents. The Facility is classified as a TSDF and operates under EPA identification number ILD 07442938. The hazardous waste management operations include container storage and the combining/commingling of compatible wastes. Wastes are received in DOT-approved containers.

The entire operation is located within a single enclosed building. A Facility plan showing the location of the hazardous waste management unit is provided in Attachment G-4.

This CP contains emergency provisions to minimize hazards to human health or the environment from fires, explosions, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents for the entire Facility. A copy of this CP and all revisions will be maintained at the Facility.

G-2 EMERGENCY COORDINATORS

[35 IAC 724.152(d), 724.155, 40 CFR 264.52(D), 264.55]

If an imminent or actual emergency is discovered, the Emergency Coordinator (either on the Facility premises or on call) will be immediately notified. The primary Emergency Coordinator (EC) will be contacted first; if he/she is not available, the alternate(s) will be contacted (in the order listed) until one is reached. A list of ECs with address and telephone numbers is provided in Attachment G-1 and will be posted in key areas of the Facility.

The employee who discovers an imminent or actual emergency shall take responsibility for notifying the EC or the alternate. At least one of the designated ECs will either be at the Facility or on call and available to come to the Facility to respond to an emergency seven (7) days per week. It is important to note that in non-operational times there are no processes occurring, thus the potential for an emergency in a non-operational time is remote.

The EC and the alternates are thoroughly familiar with all aspects of the Contingency Plan, all operations and activities at the Facility, the location and characteristics of wastes handled, the locations of all records within the Facility, and the Facility layout. They have the

authority to commit the resources necessary to implement the contingency plan. The EC or the alternate(s) will coordinate and direct all response efforts and personnel.

In the event that the Melrose Park Fire Department (MPFD) responds to an emergency at the Facility, the MPFD Supervisor assumes the duties and authorities of the EC. The MPFD Supervisor and the Emergency Coordinator then act together to coordinate and direct the response effort. The plant EC's principal authority is to effectively provide the MPFD Supervisor with comprehensive and detailed information concerning plant operations and the location and characteristics of materials handled.

A listing of the emergency response agencies and organizations which may be called upon to provide emergency assistance at the Facility is provided in Table G-2 with their appropriate contact numbers.

At present, the local Police and Fire Departments and the local Hospital have a copy of the contingency plan.

G-3 IMPLEMENTATION

[35 IAC 724.152(a), 724.156(d), 40 CFR 264.52(A), 264.56(D)]

The provisions of this Contingency Plan must be carried out immediately whenever there is an imminent or actual incident, such as fire, explosion, or release of hazardous waste or hazardous waste constituents which could adversely affect human health or the environment. Minor leaks or spills in the hazardous waste storage, staging or process areas (i.e., small quantity within a containment area that can easily be managed and cleaned by the personnel and equipment at hand) would not normally trigger the formal implementation of the CP but would be managed by the Emergency Coordinator or the alternate(s).

Leaks or spills will only trigger formal implementation of the CP, should the EC determine that such leaks or spills represent an imminent or actual threat to human health or the environment. It is noted that the methods addressed in the CP, and the personnel training conducted for contingency procedures, are applicable to any potential minor leak or spill. Also, a fire in the incipient stage will not normally trigger the formal implementation of the CP since Facility personnel have been trained in a fire extinguisher program, as defined under OSHA 1910 Subpart L. An incipient fire is defined as a fire which can be extinguished with approximately two 20-pound fire extinguishers. Fires in the incipient stage will only trigger implementation of the CP should the EC determine that such fires represent an imminent or actual threat to human health or the environment.

The EC and the Alternate are very familiar with operations at the Melrose Park Facility. Both individuals work at the Facility and thus are constantly aware of the types, amount, variety and location of wastes stored on site and general waste handling procedures. The individuals are

also very familiar with the contents of this CP and are thus aware of the possible hazards of any type of incident relating to the hazardous wastes.

The following section offers the EC guidelines to evaluate the implementation of the CP.

A. Fire and/or Explosion

1. A fire caused the release of toxic fumes (based on G-4c);
2. The fire spreads and could possibly ignite materials or other locations on site or could cause heat-induced explosions;
3. The fire could possibly spread to off-site areas;
4. Contaminant could spread from the use of water or water and chemical fire suppressants external to the Facility; or

5. An explosion has occurred or an imminent danger exists that an explosion could occur at the Facility.

B. <u>Spill or Material Release</u>

The Contingency Plan will be implemented in the following situations:

1. The spill results in the release of toxic liquids representing a health hazard.
2. The spill is major and could result in soil contamination and/or ground water pollution.

G-4 EMERGENCY RESPONSE PROCEDURES

G-4a Notification

[35 IAC 724.156(a), 40 CFR 264.56(a)]

In the event of an emergency situation, Facility personnel may be notified either by the use of the P.A. system or by verbal communication. The Facility is relatively small and thus verbal communications would typically serve as the quickest method of alerting other Facility personnel of an emergency situation. The person identifying the emergency situation shall be responsible for alerting other Facility personnel, including the EC.

1. When the CP is activated, once immediate concerns involving human health and the environment have been addressed by the emergency response personnel, the EC will notify within 24 hours the appropriate national, state, and/or local departments, agencies and organizations with designated response roles, including the Risk Management Department of Detrex Corporation. (see Attachment G-2).

2. When notifying response agencies, the EC will be prepared to furnish the following information:

   a) Name and telephone number of reporter;
   b) Name and address of Facility;
   c) Time and type of incident (e.g. release, fire);
   d) Name and quantity of material(s) involved and to what extent;
   e) The extent of injuries, if any; and,
   f) The possible hazards to human health, or the environment, outside the Facility.

G-4b Identification of Hazardous Materials

[35 IAC 724.156(b), 40 CFR 264.56(B)]

In the event of an emergency situation, the EC or his alternate will be contacted immediately. Upon notification, the EC will take the necessary steps to immediately identify the character, exact source, amount and areal extent of any released materials.

The EC and the alternate(s) are familiar with the characteristics of all hazardous materials handled at the Facility and have access to the appropriate waste characterization information kept on file in the office. They also have access to the Operating Record which contains up-to-date information on the inventory of hazardous materials and wastes at the Facility.

Based upon the knowledge of the types and locations of all hazardous materials at the Facility, and on a thorough visual inspection of the situation, an accurate identification of the hazardous materials existing in an emergency situation will be possible.

G-4c Assessment

[35 IAC 724.156(c) and (d), 40 CFR 264.56(C), 264.56(D)]

Upon discovery or notification of an emergency situation, the Emergency Coordinator will assess possible hazards to human health or the environment that may result from the release, fire or explosion. This assessment shall consider both direct and indirect effects of the release, fire, or explosion, including the effects of any toxic, irritating, or asphyxiating gases that are/were generated, or the effects of any hazardous surface water runoff from water or chemical agents used to control fire and heat-induced explosions.

The procedure for assessing possible hazards includes:

1. Identification of hazardous properties of the materials involved or by-products thereof.
2. Determination of threat to human health or the environment, both on site and off site.
3. Assess any environmental conditions (e.g. windspeed and direction) that may contribute to the seriousness of the hazard.
4. Determine the readiness and availability of response equipment, both on site and off site.

Specific Assessment of Possible Hazards to Human Health or the Environment

The EC or alternate(s) will evaluate information regarding the following:

1. The quantity of material released (from visual observations and Facility records);
2. The characteristics of the material (including physical and chemical properties, toxicity information from reference sources such as the handbooks for chemical substance from NIOSH or ACGIH, etc.); and
3. The potential for employee exposure (such as the generation of vapor/mists or dermal contact).

This information will be used to determine if there is a need to evacuate personnel from the Facility. Once the concern for the safety of Facility personnel is taken into account, the EC or alternate will use the above information, along with such items as the zoning map, the wind rose, and sewer location maps found in Attachments B-2 through B-4 to determine if there could be a threat to human health and/or the environment outside of the Facility. If a concern does exist, the local emergency response agencies will be contacted. The local agencies will then determine if evacuation beyond the facility exist.

Although each potential threat to human health or the environment will be evaluated/assessed by the EC or alternate(s) on a case-by-case basis, the following four scenarios have been developed to provide general guidance to the EC or alternate(s). These and other possible scenarios may be discussed during training. In the event a situation occurs that is not covered in one of these scenarios, and the EC or alternate(s) are not absolutely sure of appropriate protective steps, the EC or alternates are directed to error on the conservative side and implement the Contingency Plan.

1. Emergencies which result in a spill or release of hazardous material which <u>cannot</u> be controlled by plant employees but will be contained by the secondary containment system shall <u>not</u> be deemed a hazard to Human Health or the Environment.

In the event that the release generates gasses which cannot be controlled by the employees but can be contained by the building, to the extent that the amount escaping to the surrounding areas are below hazardous levels, then the release

will not be considered a threat to the environment, but may be considered a threat to human health for those responding to the incident.

2. Emergencies which result in a spill or release of hazardous material which cannot be controlled by plant employees or the secondary containment system but does not reach storm drains, ponds, creeks, rivers or other bodies of water which are used for irrigation of food crops or can otherwise enter aquifers or reservoirs which are used for human consumption shall be considered a hazard to the environment.
3. Emergencies which satisfy the criteria in 2 above and may possibly reach storm drains, ponds, creeks, rivers or other bodies of water which are used for irrigation of food crops or can otherwise enter aquifers or reservoirs which in turn are used for human consumption shall be considered a hazard to the environment and to human health.
4. In the event that a major gaseous release escapes the boundaries of the Facility or if the material has a flash point of less than 100° F (i.e., flammable liquid) and may create an explosion/fire, the release will be considered a threat to human health and the environment.

If the EC determines that the release, fire, or explosion could threaten human health or the environment outside the boundaries of the Facility, he will procede with the notification procedures detailed in Section G-4a of this Contingency Plan.

G-4d Control Procedures

[35 IAC 724.152(a), 40 CFR 264.52(a)]

Potential accidents are classified into three general areas:

1) Fire and/or explosion involving hazardous waste or hazardous waste constituents;
2) Accidental release in a liquid form of hazardous waste or hazardous waste constituent; and
3. Accidental release in the form of a vapor of hazardous waste or hazardous waste constituents.

Control Procedure - Fire and/or Explosion

The hazardous waste management operational areas are accessible by fire-fighting and other emergency equipment. Response procedures in the event of a fire and/or explosion will be as follows:

1. Facility personnel will notify the office via two-way radio or other communication methods (example, verbal);
2. The Emergency Coordinator will be notified;

3. If a fire is minor (i.e. in incipient stage), facility fire-fighting equipment such as a fire extinguisher will be used to extinguish the fire. Location and type of fire extinguishers at the facility are shown in Attachment G-4;
4. In the event that Step 3 fails to control the fire, Steps 5, 6 and 7 will be implemented and all employees will immediately vacate the premise. Personnel will meet and be accounted for at primary or alternate meeting areas;
5. If a fire and/or explosion is major, the fire department will be contacted at 911, as well as other authorities as deemed necessary;
6. Any operating units such as process equipment, boilers, pumps, etc., would be shut down as expeditiously as possible. The type of equipment operating is such that an emergency shut down will not create a potential for problems;
7. If time permits, and employees will not be placed into danger, power from the main disconnects will be shut down (locations shown on Attachment G-4);
8. The EC has the authority to direct other necessary actions as required;
9. An "all clear" signal will be given when the fire and/or explosion has been extinguished and the personnel's safety is no longer endangered; and
10. After a fire and/or explosion has been extinguished, cleanup procedures will commence. All emergency equipment used must be replaced, repaired, recharged or otherwise be in good operating condition and placed in the appropriate location before normal operations resume.

Control Procedure - Accidental Release, Liquid

If an accidental release of liquid occurs which cannot be controlled with absorbent material, the following steps will be taken:

1) Plant personnel will notify the office via telephone or by personal communication.
2) The EC will be notified. Appropriate Emergency Response Agencies (i.e., Emergency Spill Cleanup) as listed in Attachment G-2, will be notified as deemed necessary;.
3) The exact source and type of release of hazardous material/waste/ constituent will be determined.
4) All pump(s) contributing to the release will be shut off.
5) Any section(s) of pipe contributing to the release will be isolated by closing the appropriate valves.
6) If the discharge is from a container, the container will be turned, if possible, to orient the leak toward the top if it will reduce or stop the discharge. Properly trained Detrex personnel will proceed to place the container into an overpack, or transfer into another container, as soon as practical and no later than within one-

half hour of first noting the leak. The time, date, and individual discovering the leak, as well as the time of first response will be noted in the operating logs;.

7) A temporary dike of absorbent material will be placed around the discharge area.
8) All doors to the outside will be opened if the vapor(s) associated with the release are minor in nature as found in G-4d(3);.
9) If there is a major release of product which may endanger human health, plant personnel will be evacuated from the building. Personnel will meet and be accounted for in front of the Facility.
10) Clean-up procedures, which may include notification of a spill clean-up firm, furnishing the clean-up crew with physical and/or chemical properties of waste and amount of waste released, shall be implemented.

a) Clean-up of released waste from containers: The waste will be collected via use of absorbent material for small spills. The contaminated material will then be placed in open top steel drums and transported off site to a permitted treatment/disposal Facility. For large spills, the waste will be collected with a pump and placed in steel drums for reclamation. The balance shall be cleaned up with absorbent material as stated above.b) Decontamination: Following cleanup with absorbent material, the affected area of the secondary containment area will be swept and all sweepings will be drummed. The pad may be subsequently decontaminated by steam cleaning. Any wash water generated will be collected in drums. All drummed sweepings and/or wash water will be transported off site for treatment/disposal at a permitted Facility.

c) Clean-up of contaminated soil: Should the spill or release occur outside the secondary containment area (i.e. external to the building), cleanup will be accomplished by a firm specializing in such procedures. All visually contaminated soils, where practical, will be excavated and disposed as appropriate, at an EPA permitted hazardous waste Facility. Any excavations may be restricted by building foundations.

11) Emergency equipment used, must be replaced, repaired, recharged or otherwise be in good operating condition and placed in the appropriate location before operations resume.

G-4e Prevention of Recurrence or Spread of Fires, Explosions, or Releases [35 IAC 724.156(e), 40 CFR 264.56(e)]

Actions to prevent the recurrence or spread of fires, explosions or releases may include:

1) Halting operations.
2) Collecting and containing released wastes.
3) Prohibiting smoking in all areas except designated smoking areas.
4) Using non-sparking tools.
5) Protecting the area from open flame or heat generating activities.
6) Update daily and weekly inspection forms as needed.

All reasonable safety procedures will be followed prior to resuming operations.

G-4f Storage and Treatment of Released Material
[35 IAC 724.156(g), 40 CFR 264.56(G)]

Immediately after an emergency, the EC will make arrangements for proper treatment, storage and/or disposal of all water and contaminated materials resulting from the release, fire or explosion. All resulting wastes generated will be considered a RCRA hazardous waste and managed as a RCRA waste unless it can be demonstrated to be non-regulated.

G-4g Incompatible Waste
[35 IAC 724.156(h)(1), 40 CFR 264.56(h)(1)]

The EC will insure that wastes, which may be incompatible with the released material, are treated, stored, or disposed until cleanup procedures are completed.

G-4h Post-Emergency Equipment Maintenance
[35 IAC 724.156(h)(2), 40 CFR 264.56(H)(2)]

After an emergency event, or as required during the emergency response, all emergency equipment utilized in the affected area will be cleaned, or replaced, so that they are suitable for future use. Prior to resuming operations, an inspection of all utilized safety equipment will be conducted. All proper authorities will be notified that the post-emergency equipment maintenance has been performed and operations will resume.

G-4i Container Spills and Leakage
[35 IAC 724.152, 724.271, 40 CFR 264.52, 264.171]

Any container identified to have a leak will be removed from service. If any contents remain in the container, the contents will be pumped out to another container or the entire container will be placed in an overpack container. An empty container will

then be managed in accordance with 40 CFR 261.7. Any released waste will be cleaned up within 24 hours of discovery.

G-4j Tank Spills and Leakage
[35 IAC 724.294(c)(1)]

Detrex Corporation does not and never has had a hazardous waste storage tank at the Facility in Melrose Park, Illinois.

G-4k Waste Pile Spills and Leakage
[35 IAC 724.352, 724.353]

Detrex Corporation does not and never has had a waste pile at the Facility in Melrose Park, Illinois.

G-4l Surface Impoundment Spills and Leakage
[35 IAC 724.322, 724.327, 40CFR264.227]

Detrex Corporation does not and never has had a surface impoundment at the Facility in Melrose Park, Illinois.

G-4m Incinerator Spills and Leakage
[35 IAC 724.152]

Detrex Corporation does not and never has had an incinerator at the Facility in Melrose Park, Illinois.

G-4n Landfill Leakage
[35 IAC 724.152, 724.402(b)]

Detrex Corporation does not and never has had a landfill at the Facility in Melrose Park, Illinois.

G-5 EMERGENCY EQUIPMENT [35 IAC 724.152(e)]
[40 CFR 264.52(e)]

The type and physical location of Facility's emergency equipment, including fire equipment, spill control equipment breathing apparatus and medical treatment facilities is presented in Attachment G-3.

G-6 COORDINATION AGREEMENT REQUIREMENTS

[35 IAC 724.137, 724.152(c), 40 CFR 264.52(C), 264.37]

A copy of this contingency plan has been forwarded to the appropriate agencies and acknowledgment agreements, where available, have been included in Attachment G-4.

To familiarize police, fire department, and hospital officials with the layout of the Facility, properties of the hazardous wastes handled at the Facility and associated hazards, entrances to the Facility, possible evacuation routes, and other aspects of the Facility, copies of the contingency plan have been submitted to the appropriate officials.

Each person, or the chief officer of each department, agency, or organization which receives a copy of the Contingency Plan was asked to sign a Coordination Agreement form to acknowledge that he/she reviewed the plan, understood the department's, agency's or organization's role under the plan, and that all members of the department, agency, or organization will be informed of the plan's content and their individual responsibilities. The copy of the Contingency Plan and the request for signed acknowledgment is sent by certified mail to each organization or hand carried with proper signature. The certified mail receipts and returned signed acknowledgments, where available, are kept in the Facility office.

G-7 EVACUATION PLAN

[35 IAC 724.152(f), 40 CFR 264.52(F)]

If an emergency situation occurs which cannot be resolved by plant personnel and a plant evacuation is necessary, the Emergency Coordinator will signal employees, over the intercom system or by personal communication, to evacuate the Facility. All employees will exit the Facility by the most expeditious route (see evacuation routes in Attachment G-4) and meet in front of the Facility or another designated area outside of the Facility to be accounted for. The EC will then notify the appropriate emergency response agencies. The EC, based on his assessment, may deviate from established procedure in order to effectively and safely respond to emergency situations.

G-8 REQUIRED REPORTS

[35 IAC 724.156(j), 40 CFR 264.56(j), 329 IAC 3.1-9-2(4)]

As required, any emergency event requiring implementation of the contingency plan will be reported in writing to the Illinois Environmental Protection Agency (IEPA) Division of Land Pollution Control (DLPC) Compliance Section within fifteen (15) days of the event. This report will, at minimum, contain:

1) Name, address, and telephone number of the owner or operator;
2) Name, address, and telephone number of the Facility;

Pollution Control (DLPC) Compliance Section within fifteen (15) days of the event. This report will, at minimum, contain:

1) Name, address, and telephone number of the owner or operator;
2) Name, address, and telephone number of the Facility;
3) Date, time, and type of incident (i.e. fire, explosion);
4) Name and quantity of material(s) involved;
5) The extent of injuries, if any;
6) The assessment of actual or potential hazards to human health or the environment, where this is applicable; and
7) Estimated quantity and disposition of recovered material that resulted from the incident.

Detrex will place in the operating record all reports of any incident that requires implementing the Contingency Plan.

The Risk Management Department of Detrex Corporation will submit and retain on file reports to the appropriate agencies and all applicable information relevant to the event for which the Contingency Plan was implemented.

The Risk Management Department of Detrex will also inform the appropriate departments, agencies, and authorities that cleanup is complete before operations at the Facility resume.

The Risk Management Group of Detrex will also inform the appropriate departments, agencies and authorities (including: DPLC Compliance Section, Field Operations Section and Illinois Emergency Services and Disaster Agency) that clean-up is complete before operations at the Facility resume.

G-9 AMENDMENTS TO THE CONTINGENCY PLAN

[35 IAC 724.154, 40 CFR 264.54]

The contingency plan will be reviewed and immediately amended, if necessary, whenever:

1) the Facility permit is revised
2) the plan fails in an emergency
3) the Facility changes its design, construction, operation, maintenance, or other circumstances in a way that materially increases the potential for fires, explosions or releases of hazardous waste or hazardous waste constituents, or changes the response necessary in an emergency
4) the list of emergency coordinators changes
4) the list of emergency equipment changes

6. the actions/responses necessary to comply in an emergency situation change; or
7. if required due to changes in the regulations.

All changes in this plan will be sent to every organization on the contingency plan distribution list within 30 days of the effective date of the change.

ATTACHMENT G-1

EMERGENCY COORDINATORS

ATTACHMENT G-1

EMERGENCY COORDINATORS

Name	*Job Title*	*Work Phone*	*Home Phone*	*Home Address*
Primary Mrs. Julie Derengowski	Secretary	(708) 345-3806/7	(708) 531-1934	112 Edward Northlake IL 60164
Alternate(s) Richard Fuentes	Driver / Warehouseman	(708) 345-3806/7	(708) 682-1841	912 Moccasin Carol Stream IL 60188

ATTACHMENT G-2

EMERGENCY RESPONSE AGENCIES / AUTHORITIES

Date: 04/30/02
Revision: 02-1

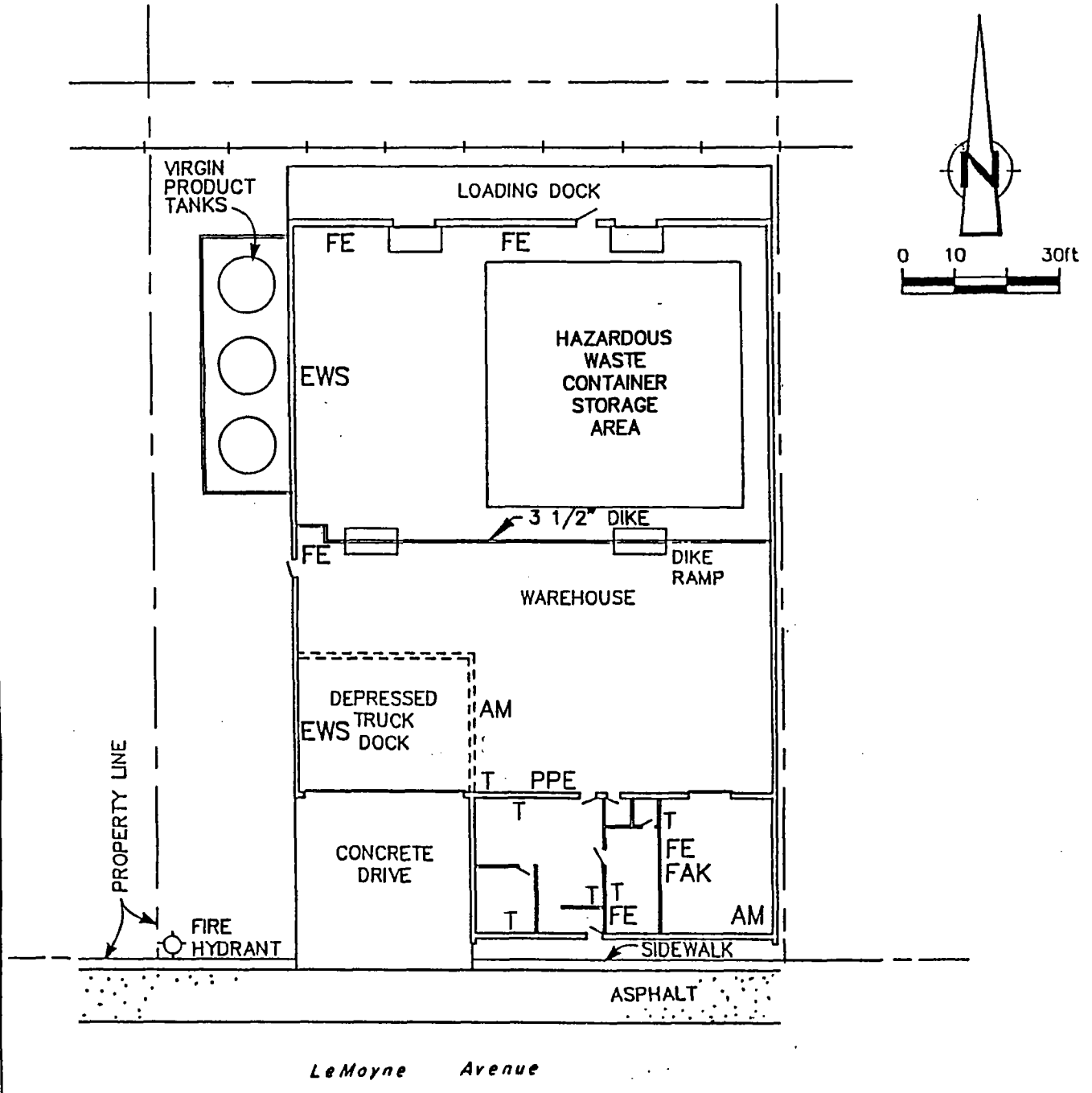
ATTACHMENT G-2

EMERGENCY RESPONSE AGENCIES/ORGANIZATIONS

NAME	ADDRESS/CONTACT	PHONE NUMBER
Police Department	1 North Broadway Melrose Park IL 60160	911 or (708) 344-2124
Fire Department	3601 W. Lake St. Melrose Park IL 60160	911 or (708) 344-2121
Gottlieb Memorial Hospital	701 W. North Ave. Melrose Park IL 60160	(708) 681-3200
Gottlieb Occupational Health Services	2930 N. Mannheim Rd. Melrose Park IL 60160	(708) 451-4060
Emergency Response Center		800-424-8802
Detrex Corporation - Risk Management Group (Detroit, Mi.)	PO Box 5111 Southfield MI 48086-5111	(248) 358-5800 (248) 799-3820 (24-Hr. Emergency Phone Number)
State EPA		(217) 782-3637
Illinois Emergency Services and Disaster Agency	110 E. Adams Springfield IL 62701	(217) 782-4268
Emergency Cleanup of Spill: SET	450 Sumac Rd. Wheeling IL 60090	(847) 537-9221 (847) 437-7455 24-Hr. Emergency Phone Number

ATTACHMENT G-3

LOCATION OF EMERGENCY AND SAFETY EQUIPMENT



LEGEND

AM – ABSORBENT MATERIAL
EWS – EYE WASH STATION
FAK – FIRST AID KIT
FE – FIRE EXTINGUISHER

T – TELEPHONE/P.A. SYSTEM
PPE – PERSONNEL PROTECTIVE EQUIPMENT (GLOVES, GOGGLES/FACE SHIELDS, BOOTS)

LOCATION OF EMERGENCY AND SAFETY EQUIPMENT

Detrex Corporation
Melrose Park, Illinois Facility

ATTACHMENT G-4

FACILITY PLAN
&
EVACUATION ROUTES

Attachment G-4

EMERGENCY EQUIPMENT

1. Communications System

- Telephone/public address system (notify in-house staff and external agencies)
- hand-held two-way radios (within facility and immediate area)

2. Fire Control Systems and Equipment

- Fire extinguisher - for combustibles, flammables, liquids, and electrical fires;
- Fire hydrants - 1 hydrant located approximately 50 feet out from the facility building;

3. Spill Control Equipment

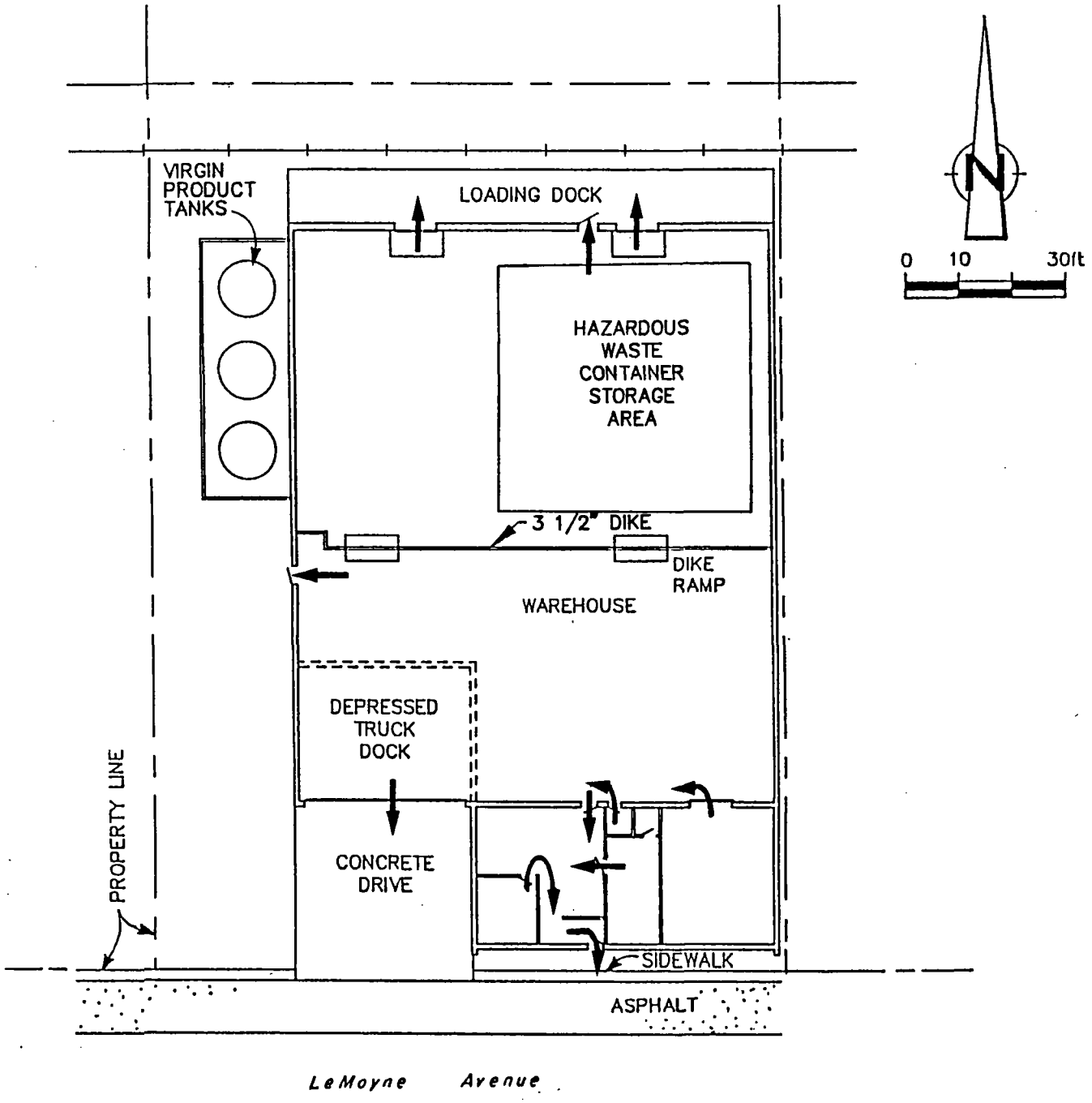
- Absorbent material - approximately 5 gallons absorbed per bag
- Shop vac, drum pump
- Brooms, shovels

4. Health and Medical Emergency Equipment/Supplies

- Protective clothing (aprons, coveralls)
- Emergency lighting (10 - 30 minutes lighting for escape)
- Eye wash/safety shower - adequate supply of fresh water for flushing eyes and skin
- First-aid stations
- Safety glasses/goggles
- Gloves (cotton, leather, rubber)
- Boots

5. Material Handling Equipment

- Lift Truck
- Drum Hand Truck



LEGEND

→ EVACUATION ROUTE

EVACUATION ROUTES
Detrex Corporation
Melrose Park, Illinois Facility

CRA

ATTACHMENT G-5

COORDINATION AGREEMENT ACKNOWLEDGMENTS

May 31, 2002

VIA: CERTIFIED MAIL
«sal» «first» «last»
«title»
«Company»
«Address»
«City» «State» «zip»

Re: Emergency Responder Notification,
Revision of Facility Contingency Plan.

Dear: «sal» «last»:

Detrex Corporation has named your agency as an Emergency Responder on the Contingency Plan for our hazardous waste Treatment-Storage-Disposal facility located at 2537 LeMoyne Ave, Melrose Park, IL 60160. As an Emergency Responder, an occasion may arise where Detrex Corporation would enlist the services of your company to provide emergency response activities, which may arise as a result of hazardous waste management activities at the facility.

As required by 40 CFR 264.37, Detrex has enclosed a copy of the revised Contingency Plan for the above noted facility. Please note that if you currently have a copy of our Contingency Plan on file, it may include significant changes from the enclosed Plan. Detrex maintains a 24 hour Emergency Telephone Number, (248) 799-3820. This number should only be used in the event all local personnel are not available in the event of an emergency.

Please sign the enclosed acknowledgement form and return it in the enclosed envelope as soon as possible.

Should you have any questions regarding the revised Contingency Plan, please feel free to contact Mr. Stan Miles or myself at 317-842-2225 or 248-358-5800 respectively. Your prompt response is greatly appreciated.

Sincerely,

David D. Craig
Manager of Environmental and Safety Compliance

Enclosure:
Draft Contingency Plan and acknowledgment form

cc: File
Facility
ILEPA

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SECTION H

LIST OF ATTACHMENTS

SECTION H

PERSONNEL TRAINING

This section outlines the personnel training program completed by all facility employees of Detrex Corporationin Melrose Park, Illinois. The information is provided pursuant to the Illinois Rule 35 IAC 703.183(1) and 724.116. The applicable section(s) of the Illinois regulations is referenced as appropriate.

H-1 OUTLINE OF TRAINING PROGRAM
[35 IAC 724.116(a)(1)]

Detrex Corporation has developed a personnel training program for training employees in the safe handling of the hazardous wastes received at the facility. The training consists of study, on-the-job training and competence evaluation. Each employee must complete the full training program before working unsupervised in the facility. The training program provides each employee with a firm knowledge of how to handle the hazardous wastes and also how to react, in the event of an emergency situation, to protect human health and the environment.

H-1a Job Titles/Job Description
[35 IAC 724.116(d)(1) and (d)(2)]

Detrex maintains the following documents and records at the facility:

1) The job title for each position related to hazardous waste management, and the name of the employee currently filling each job.
2) The written job description for each position as described in (1) above, which includes experience, skills and responsibilities. Job descriptions, a copy of which is provided in Attachment H-1, are kept on file in the plant office.
3) A written description of the type and amount of both introductory and continuing training given to personnel for each position related to hazardous waste management.
4) Records that document that the training and job experience have been completed by facility personnel.

Detrex maintains training records of former employees involved with hazardous waste management for three years from the date they last worked at the facility and will maintain training records on current personnel until closure of the facility.

H-1b Training Content, Frequency, and Techniques
[35 IAC 724.116(c) and (d)(3)]

The program developed by Detrex Corporation for training employees in the safe handling of hazardous wastes includes study, on-the-job training, and competence evaluation. Provisions are made for updating or revising the training program as necessary to ensure compliance with regulatory guidelines, changing facility conditions, and organizational changes.

A copy of the Hazardous Waste Management Facility Employee Training Program developed by Detrex is provided in Attachment H-2. This outlines all aspects of the training program, providing each employee with the information required for the safe execution of his or her responsibilities.

H-1c Training Director
[35 IAC 724.116(a)(2)]

Detrex Corporation has a training director who will be responsible for updating the existing personnel training program and ensuring all employees involved in hazardous waste management activities receive adequate training.. The Training Director attends various meetings/seminars to help keep as up-to-date as possible on changing regulations that affect operations.

A responsibility of the Corporate Training Director will be the development of Standard Operating Procedures (SOPs) for the various hazardous waste management activities (i.e. drum sampling, drum filling station, etc). These SOPs will be appended to the Employee Training Manual and will be used in the future to train new employees.

H-1d Relevance of Training to Job Position
[35 IAC 724.116(a)(2)]

Contents of the training program is tailored to each job position. The Warehouseman receives training in the operation of material handing including: Drum Filling Station, Waste Sampling, Safety Equipment, Emergency Equipment, and Forklift and Hand Truck Operation.

The Truck Operator receives training in the operation of material handling including: Drum Filling Station, Safety Equipment, Emergency Equipment and Transportation and Material Handling Equipment.

The secretary receives training in Safety and Emergency Equipment, Record Keeping, Manifesting of Hazardous Waste Shipments, Inventory, Waste Sampling, Contingency Plan procedures and other clerical duties.

The Branch Manager receives training in the Operation, Inspection and Recordkeeping for: Process Equipment, Safety Equipment, Emergency Equipment, Transportation and Material Handling Equipment and Contingency Plan Procedures.

H-1e Training for Emergency Response
[35 IAC 724.116(a)(3)]

This training program is designed to ensure that personnel not only handle hazardous wastes in a safe manner, but also properly respond to emergency situations. The program trains hazardous waste handling/management personnel to maintain compliance under both normal operating conditions and emergency conditions.

Emergency response procedures, as described in detail in Section G-4 of this permit application, consist of a number of steps.

1) Warn all facility personnel of emergency situations.
2) Notification of appropriate state or local agencies with designated response roles if necessary.
3) Identification of nature and source of released material and assessment of potential hazards to human health or the environment.
4) The incident command hierarchy and individual roles.
5) Implementation of appropriate control procedure(s) based on type of accident.

    a) <u>fire/explosion</u>
        - use fire fighting equipment or call fire department
        - shut off process equipment
    b) <u>liquid release</u>
        - isolate and shut off release - if possible
        - place temporary dike or absorbent material
        - activate ventilation fans
    c) <u>vapor release</u>
        - activate ventilation fans and open doorways

6) Cleanup of affected area and emergency equipment.
7) Storage and disposal of released material.

The training plan implemented by Detrex involves study and on-the-job training in the proper emergency response procedures and the proper use of all personnel

protective equipment outlined above and described in more detail in Section G-4 of this permit application.

H-2 IMPLEMENTATION OF TRAINING PROGRAM

[35 IAC 724.116(b), (d)(4) and (e)]

A new employee is hired to fill a specific position (i.e. Warehouseman). The employee is first required to attend a meeting designating job responsiblities, job hazards and safety, and roles and expectations.. This training includes awareness of the relevant hazards of the wastes handled by Detrex, the safety precautions to ensure safe handling, and the procedures to be followed in the event of an emergency. The new employee is then to review the written training program for the position he/she is to fill. Upon completion, the employee is then given 40 hours of on-the-job training supervised by the facilities' Branch Manager within 6 month of hiring.

No employee hired to work at this facility will work unsupervised in tasks related to hazardous waste management prior to completion of the training program.

Employees are required to meet annually for reviews and updates of this training program and to discuss and study the following subjects:

1. All hazardous wastes currently being handled at the facility, noting any changes in waste type, volume, source, characteristics, or location that have occurred during the past year;
2. The status of operating conditions and procedures, noting any areas where there are problems or potential for problems. Employees participate in developing effective solutions;
3. The requirements contained in the facility's operating permit, noting any changes that have occurred during the past year. Areas where maintenance or compliance is a problem are identified and discussed, and effective solutions are sought; and
4. Incidents that have occurred in the past year that warranted use of contingency plans and/or emergency action. This review focuses on the cause of the incident and identification of steps to be taken to prevent or to ensure better handling of such events in the future.

Records documenting that the required training or job experience required to ensure that employees are trained to perform their duties in such a manner that compliance with the operating permit is assured, will be kept on site in the office. These records will be kept until closure of the facility for current employees and for 3 years from the date of the individual employee's termination for former employees. Records will include job description, employee name, training contents, date and duration of training and the instructor assessment of competency.

Date: 04/30/02
Revision: 02-1
Attachment: H-1 - 1

POSITION TITLE: **Facility Manager**

SUMMARY: Responsible to plan, direct, and coordinate the day to day operations of the facility with respect to the proper storage and shipment of both product and hazardous waste materials. As part of the function the Facility Manager also:

- May act as an emergency coordinator;
- Verifies through periodic inspections that the facility's operational records are up-to-date and correct;
- Selects, develops, motivates, and insures that all employees receive the necessary training to perform their job functions; and
- Generates, or assists Risk Management, in the preparation of reports required by the permit, or other applicable laws.

VERIFICATION:

Experience: Leadership, communication skills, decision-making abilities, motivational skills, and at least 3-5 years experience in:

- Plant operations, including environmental and regulatory exposure;
- Working knowledge of transportation operations; and
- Understanding of sales and marketing situations and be able to support the Sales/Marketing groups as needed.

Education: Associates degree or a Bachelors degree in a related field such as hazardous waste management, process control, or regulatory compliance is preferred.

RESPONSIBILITIES:

General:

(1) Supervise personnel performing the loading/unloading of bulk shipments. Insure that the Facility transport vehicle tank is clean and fee of significant residue from previous loads. Oversee execution of shipping documents.

(2) Supervise, assign, and direct employees involved in drumming operations. Specify type of drum to use. Assure good industrial practices are followed in a manner to protect employee's safety and the environment. Assure containers are properly marked and labeled in accordance with DOT regulations.

(3) Supervise operation of warehouse. Supervise scheduling of work operators. Assure clean and orderly use of warehouse space.

(4) Supervise/direct the dispatch and routing of company deliveries. Assure motor operations are performed according to regulations of USDOT and Illinois regulatory agencies. Read and retain driver logs and vehicle condition reports. Insure that company vehicles are properly maintained and serviced.

(5) Recommend hiring of operators.

Facility Manager (cont'd.)

Environmental and Regulatory Responsibilities:

The full responsibility for on-site hazardous waste management as follows:

(1) Serves as Emergency Coordinator or alternate.
(2) Supervises all record keeping operations by Office Coordinator, or for hazardous waste manifests prepared by other branch personnel.
(3) Supervises the Operators when on-site sampling is performed.
(4) Supervises the screening of hazardous wastes when performed on site.
(5) Supervises record keeping of daily and weekly facility inspection reports as performed by the Secretary, Office Coordinator, or the Facility Operator.
(6) Is the primary contact for regulatory agency personnel and the Facility Risk Management Group.
(7) Responsible for maintaining training levels of branch personnel.
(8) Has responsibility for regulatory compliance in operation of the Part B facility.

POSITION: Office Coordinator

SUMMARY: Responsibilities include: product and waste inventory, customer invoicing, maintaining accounts receivable and accounts payable, paperwork for shipment of products and waste shipments and general office duties such as, in-coming and out-going mail, maintaining files, ordering office supplies, etc..

VERIFICATIONS:

Experience: Minimum of 2 years office administrative experience with background in accounting. Must be adept in the use of computers.
Education: Minimum of high school degree or equivalent
Reports To: Facility Manager

REGULATORY RESPONSIBILITIES:

(1) May act as an alternate Emergency Coordinator.
(2) Start and maintain customer information packets for each waste shipment. These packets will include:
   A. Cover Sheet with necessary information completed.
   B. Generator Waste Profile Sheet.
   C. Copy of the waste manifest(s).
   D. Customer purchase order(s).
   E. Any other information pertaining to waste shipment(s).
(3) Maintain and control invoice/customer files in good order.
(4) Answers the phone, screens visitors, etc.
(5) Complete and maintain inventory for material stored in the branch warehouse.
(6) Help in the Scheduling of incoming shipments of products and waste.
(7) Perform additional duties/special projects as directed.

POSITION: **Warehouseman / Truck Driver**

SUMMARY: responsible for daily reclamation process, and the day-to-day operations of the hazardous waste storage area and handling of hazardous waste in accordance with the latest rules and regulations. Emphasis is also placed on the development of "Better Ways" to operate the facility in a more efficient manner.

QUALIFICATIONS:

EXPERIENCE: Knowledge of hazardous waste management, including handling and storage of hazardous waste preferred. May also require a CDL to transport hazardous materials.

Education: High school degree or equivalent

Courses: Training in hazardous waste management as required by 40 and 49 CFR for the handling of hazardous materials and waste.

Reports to: Facility Manager

REGULATORY RESPONSIBILITIES:

(1) May act as an alternate Emergency Coordinator in implementing the Transporter's Contingency Plan for accidental spills of hazardous material while on the road.

(2) Comply with Detrex procedures for the transfer and storage of hazardous waste. This includes completion of all specified training courses.

(3) Load and unload: containers of product, waste, and empty containers onto transport vehicles for shipment. Properly complete any paperwork associated with the shipment.

(4) Ensuring that hazardous material/waste containers accepted for transport meet all conditions as required in the Code of Federal Regulations, part 49, section 172-178, and that all labels and manifests are proper and in accordance with all federal and state codes. This includes, but is not limited to, insuring that containers have the: proper markings, labels, and paperwork for shipment

(5) Sampling of all wastes received at the facility in accordance the WAP as found in section C the Facility part B permit Application.

(6) Properly store wastes in accordance with the permit

(7) Provide the Office Coordinator information on the wastes received at the facility so that records may be maintained.

(8) Make daily inspection and complete forms as necessary. This involves maintaining all equipment noted in the contingency plan.

Perform additional duties/special projects as directed

ATTACHMENT H-2

EMPLOYEE TRAINING PROGRAM OUTLINE

Date: 04/30/02
Revision: 02-1
Attachment: H-2 - 1

TRAINING OUTLINE

I. Purpose

II. Objective

III. Definitions

A. DOT HM-215A
1. Hazardous Materials
2. Hazardous Substances
3. Hazardous Wastes
   a. D001
   b. D002
   c. D003
   d. D004-D042
   e. Subpart D Listed Materials
4. Shipping Papers (Manifests)
   a. Sending, Receiving, Uniform
   b. Signature & Dates
   c. Proper Shipping Names
   d. Additional Information
5. Markings
   a. Requirements
   b. Duplicating/Conflicting
6. Placards & Labels
   a. Hazard Class
   b. Where Placed
   c. When Offered
7. Containers
   a. Reuse
   b. Performance-Oriented Requirements

B. EPA
1. Storage Requirements
   a. Location
   b. Containment
   c. dentifying Markings
2. Container Condition
   a. Closure
   b. Leaks
3. Storage Limitations
   a. Conditionally Exempt
   b. Small Quantity
   c. Large Quantity
4. Training Requirements

IV. Written Program Requirements

A. Site General Requirements
   1. Physical Location

TRAINING OUTLINE

B. Written Program
1. Purpose of the Plan to Minimize Hazards
2. Role of Coordinator
   a. Notify State, Local Authorities, departments
   b. Assessment
   c. Identification
   d. Act to Mitigate
   e. All Clear
   f. Report Written
3. Hazards Covered under Plan
   a. Fire
   b. Explosion
   c. Release (sudden/non-sudden)
4. General Plan Requirements
   a. Who Notifies Coordinator
   b. Information to Provide (5 W's & H)
   c. Special Duties of Employees
   d. Fire Department
   e. Copy of Plan
   f. Methods of Notification (facility)
5. Emergency Plans
   a. What Activates the Plan (imminent or actual hazard)
      (1) Fire/Explosion
         - *toxic fumes*
         - *fire spreads - ignite or explode others*
         - *spread off-site*
         - *explosion possibility*
      (2) Spill/Release
         - *release above reportable quantity (RQ)*
         - *release to ground outside of containment areas*
   b. PLAN Implementation
      (1) Notification
         - *personal*
         - *response agencies*
         - *determine extent of emergency*
         - *command post*
         - *notify others*
         - *determine if in-house can handle*
      (2) Identification
         - *material, amount, source, characteristics, etc.*
      (3) Assessment
         - *effect to human health and/or environment: direct/indirect*
         - *hazardous properties*
         - *threat to human health and/or environment on- and off-site*
         - *environmental conditions to worsen effect*
         - *status of response equipment*

TRAINING OUTLINE

c. Responding to Emergencies
   (1) Fire and/or Explosion
   (2) Accidental Release - Liquid
   (3) Accidental Release - Vapor
d. Prevention of Recurrence of Spread of Fires, Explosions or Releases
e. Storage and Treatment of Released Material
f. Storage of Incompatible Wastes
g. Storage of Ignitable Wastes
h. Post-Emergency Equipment Maintenance
i. Container Spills and Leakage
j. Tank Spills and Leakage

6. Emergency Equipment
7. First Aid
8. Coordination Agreements
9. Evacuation
10. Training

C. Required Reports
D. Amendments to The Plan
E. Permit Parameters

ATTACHMENT H-3

CURRICULUM VITA - TRAINING DIRECTOR

ATTACHMENT H-3

DAVID D. CRAIG, CHMM, CET
CAREER HISTORY

DETREX CORPORATION, Southfield MI **1993-Present**
Chemical and related fields.

Manager of Environmental and Safety Compliance 1995-Present
Responsible for Environmental Compliance within the company.

- Generate RCRA permits for Treatment, Storage, and Disposal Facilities
- Manage all aspects of the transportation of hazardous waste, including permitting of trucks
- Training Director for the Company
- Manage the company's fleet of vehicles and trucks

Corporate Environmental and Safety Engineer, Southfield MI 1993-1995
Responsible for assisting the Corporate Manager of Regulatory Compliance in completion of RCRA programs.

- Assisted in the drafting of revised safety programs for all facilities;
- Assist in the auditing of Detrex and third party facilities to insure compliance with all Governmental Regulations;
- Assist in the training of all facility personnel in applicable OSHA, EPA, and DOT programs;
- Developed newsletter to inform all facilities of new pending or promulgated regulations as found in the Federal Register.

LOCKHART CHEMICAL, Allison park PA **1991-1993**
Manufacturer of Sulfonates and Coatings used in the formulation of end use products for the steel and auto industries.

Regulatory Engineer, Flint MI
Operated as Lab Manager for facility, managed plant security, developed and implemented safety programs, activated safety committee, obtained CAA permits from the MDNR, and completed all governmental reports.

- Developed safety programs;
- Developed Waste Tracking Program;
- Obtained a AC Construction and Operating permit associated with an Incinerator;
- Brought facility into compliance with all governmental reporting requirements.

QUAKER CHEMICAL, Conshohocken PA **1988-1991**
A chemical specialty manufacturer of products used in the steel and automotive industries. Annual revenues in excess of $200 MM.

Environmental/Safety Manager Detroit MI 1989-1991

Audited contractors, generated reports for governmental agencies, obtained equipment permits, developed and performed training programs, and worked directly with insurance carriers to resolve concerns. Acted as the Statistical Process Control (SPC) Coordinator for the Detroit Facility.

- Implemented procedural changes to reduce contaminants (fat, oil, and grease, BOD, and metals) by over 10 % in effluent discharged under pre-treatment permit;
- Developed Safety programs for various OSHA regulations;

ATTACHMENT H-3

- Managed local quality programs essential in helping obtain quality awards (Rouge Steel Q-1 and Double Eagle);
- Utilized SPC to reduce the Out of Specification (OOS) over ten fold in one key intermediate resulting in a decease in OOS in one product line by over 30%;
- Chaired SPC and safety committees, and participated in Employee Involvement Group.

Production Supervisor Detroit MI 1988-1989
Responsible for all aspects of the manufacturing operations producing nine to ten million pounds per month. These responsibilities included scheduling, answering customer inquiries, troubleshooting equipment problems, and interfacing with quality control.

ANDERSON DEVELOPMENT COMPANY, Adrian MI **1981-1988**
A specialty chemical manufacturer of proprietary and contracted products, from major chemical companies, used in the manufacture of industrial and consumer products.

Production Manager , Activated Carbon Plant 1985-1988
Managed a semi-works plant utilizing high temperature chemical process to produce an ultra high surface area carbon. Plant was managed during construction and startup.

Production Manager, Prepolymer and Intermediate Division 1981-1985
Managed production of proprietary products and custom products for outside firms. Worked with the plant manager and research group on generating cost estimates for scale up of new projects. Responsibilities included inventory control, scheduling, billing, conducting safety meetings, and assuming the role of plant manager as needed.

EDUCATION / EXPERIENCE

DOT Drug and Alcohol Compliance Workshop 1995
J.J. Keller Grand Rapids MI

Industrial Storm Water Training 1995
MDNR, Water Quality Group Livonia MI

HAZWOPER, 40 Hour Certification 1994
New Environment, Inc.

Certified HAZWOPER Trainer Workshop 1994
New Environment, Inc.

Annual RCRA Compliance Course 1994
Engineers Review, Inc. Romulus MI

Implementation of TQM Workshop 1992
GMI Engineering & Management Institute Flint MI

Fundamentals of Quality Management for Small Business 1992
US Chamber of Commerce Flint MI

Plant Level Environmental Compliance 1991
Executive Enterprises Chicago IL

Short Run SPC 1990
Hydra-Matic (UAW/GM) Yipsilanti MI

SARA III/WRTK Training Seminar 1989

ATTACHMENT H-3

Environmental Resource Center Chicago IL

Qualified Observer of Visible Emissions Training 1989
MDNR Air Pollution Control Division Wayne MI

Planning and Managing of Warehouse Operations 1989
Temple University Philadelphia PA

Management Seminar 1986

Supervisory Seminar 1983

BS, Chemical Engineering 1981
University of Michigan Ann Arbor MI

American Institute of Chemical Engineers 1981

ATTACHMENT H-4

TYPICAL TRAINING ACKNOWLEDGMENT FORM

40 CFR 262.34 HAZARDOUS WASTE GENERATORS REVIEW
AND
40 CFR 264.16 PERSONNEL TRAINING

Last Date of Review and Person Reviewing:

Name (print)	Signature

INSTRUCTOR:_____

DATE:_____

SECTION I

CLOSURE AND POST-CLOSURE REQUIREMENTS

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SECTION I

CLOSURE AND POST-CLOSURE REQUIREMENTS
[35 IAC 703.183(m), 724.210 Through 724.220]

This section identifies operational activities which are necessary to completely close the facility at the end of its intended operating life. A post-closure plan is not required because this is not a disposal facility and all wastes are being removed at closure.

Detrex Corporation operates a hazardous waste container storage area at the Melrose Park facility. Containerized wastes are stored prior to transfer of these wastes to an off-Site Detrex solvent reclamation (recycling) facility or to another off-Site permitted treatment/disposal facility.

The closure plan and financial requirements are submitted pursuant to Illinois Rule 35. The applicable sections of the Illinois regulations are referenced as appropriate.

Detrex Corporation will maintain an on-site copy of the approved closure plan, and all revision to the closure plan, until certification of closure completeness has been submitted and accepted by the Illinois Environmental Protection Agency (IEPA). Detrex will notify the IEPA at least 180 days prior to the date Detrex expects to begin final closure at the Gold Shield Solvents facility.

Upon completion of closure activities, Detrex Corporation will submit a certification to the IEPA verified by both Detrex Corporation and an independent registered professional engineer that the facility has been closed in accordance with the specifications in the approved closure plan.

I-1 CLOSURE PLAN
[35 IAC 703.183(m), 724.212]

I-1a Closure Performance Standard
[35 IAC 724.211]

This closure plan is designed to ensure that the facility will be closed in a manner that:

1) Minimizes the need for further maintenance; and
2) Controls, minimizes, or eliminates, to the extent necessary to protect human health and the environment, post-closure escape of hazardous waste, or hazardous constituents to the ground or surface waters or to the atmosphere.

The following sections present, in detail, efforts which will be made to satisfy the closure performance standard.

1-1b Partial Closure Activities
[35 IAC 724.212(b)(1) and (2)]

Detrex does not expect to partially close the hazardous waste container storage area. Procedures for final closure of the facility are discussed in Section I-1d. Final closure of the facility is not forseeable at this time.

I-1c Maximum Waste Inventory
[35 IAC 724.212(b)(3)]

The maximum hazardous waste inventory expected at any given time during the operation life of this facility is 8,800 gallons (160 x 55 gallon drums)

Attachment I-1 lists the various hazardous wastes handled at the facility, their EPA hazardous waste identification number, and their respective hazardous constituent/characteristic.

I-1d Inventory Removal and Disposal or Decontamination of Equipment
[35 IAC 724.212(b)(4), 724.214]

At final closure, assuming a third party is completing the closure, the hazardous waste drum inventory will be transferred to licensed hazardous waste trailers or tanker trucks for transportation to a permitted off-Site facility. Material transfer would be accomplished utilizing pumps and flexible hosing, or the use of container handling equipment.

I-1d(1) Closure of Containers (drums)
[35 IAC 724.278]

Following the removal of the hazardous waste inventory, the drum storage area will be swept. All sweepings will be drummed and transported off site to a RCRA permitted facility. The area will be subsequently decontaminated by steam cleaning. Wash water generated will be collected and sampled to determine if the water is a hazardous waste. All drums that test as having constituents that would make the water hazardous will be transported off site to a RCRA permitted facility.

It is estimated that approximately 220 gallons of waste wash water and one drum of solid waste will be generated during the decontamination process.

Decontamination will be verified by collecting a minimum of three samples of the final rinsate and submitting the samples for analysis of the major constituents that were in storage. Analyses will be by an approved method of SW-846. The "cleanup" level will be the appropriate MCL (Maximum Contaminant Level) for the constituents analyzed. Subsequent cleaning operations (further steam cleaning or water rinses) will be implemented as necessary until rinsate sampling and analysis indicates cleanup standards have been reached.

Rinsate samples will be collected by vacuum and transferred to the appropriate glass sampling bottles (e.g., 3 x 40 mL glass vials). The samples will be placed in coolers, packed with ice to approximately 4°C and shipped under chain-of-custody protocols to the preselected approved laboratory. One blind duplicate sample and one field blank sample will be collected for every ten rinsate samples collected as a check on laboratory and field QA/QC procedures. A trip blank will also be supplied by the laboratory and analyzed for the same parameters as the rinsate sample as a check on cross-contamination during shipment.

Subsequent to the completion of decontamination operations, a visual examination of the secondary containment area will be conducted. The visual examination is required to assess the integrity of the containment system after closure. If visible staining of the containment system is observed or cracks are found in the concrete surface within the containment area, further decontamination verification will be conducted.

Concrete core samples will be collected from any area in which visible staining is present subsequent to decontamination or where cracks in the concrete within the secondary containment area are identified. Such concrete cores will be submitted for analysis of the major constituents that were in storage. For the basis of the closure cost estimate, it is assumed that three concrete core samples will be collected. In the event concrete core samples are collected, decontamination shall be considered complete if core sample results indicate non-detect level of the major constituents in storage.

At closure, a total of approximately 65 wooden pallets used to support 55-gallon drums within the container storage area may be present. Since hazardous waste drums

are not opened after they are placed within the container storage area, the wooden pallets will not be contacted by potentially hazardous waste constituents unless a spill has occurred. After inventory removal, all wooden pallets will be visually examined to determine if hazardous waste constituents may be present. All pallets determined to have come in contact with waste, will be segregated and sent to a TSDF for disposal. All other pallets will not be considered as hazardous waste and will not be subject to the closure plan. For purposes of closure cost estimateit will be assumed that 10 pallets will be transported to a RCRA permitted facility.

It is to be noted that a comprehensive historical records review will be conducted in order to select an appropriate parameter list representing the major constituents that were in storage in the container storage area over the life of the facility.

I-1d(2) Closure of Tank Systems
[35 IAC 724.297, 724.410]

A closure plan for tanks is not required since Detrex does not utilize hazardous waste storage tanks at the facility in Melrose Park, Illinois.

I-1d(3) Closure of Waste Piles
[35 IAC 703.204(h), 724.358]

A closure plan for a waste pile is not required since Detrex does not and has never had a waste pile at the facility in Melrose Park, Illinois.

I-1d(4) Closure of Surface Impoundments
[35 IAC 703.203(f), 724.328]

A closure plan for a surface impoundment is not required since Detrex does not and has never had a surface impoundment at the facility in Melrose Park, Illinois.

I-1d(5) Closure of Incinerators
[35 IAC 724.451]

A closure plan for an incinerator is not required since Detrex does not and has never had an incinerator at the facility in Melrose Park, Illinois.

I-1d(6) Closure of Land Treatment Facilities
[35 IAC 724.380, 724.212]

A closure plan for a land treatment facility is not required since Detrex does not and has never had a land treatment facility at the facility in Melrose Park, Illinois.

I-1e Closure of Disposal Units
[35 IAC 703.183(m), 703.203(f), 703.204(h), 703.207(e), 724.328(a)(2), 724.328(c)(1)(A), 724.358(c), 724.410(a)]

A closure plan for a disposal unit is not required since Detrex does not and has never had a disposal unit at the facility in Melrose Park, Illinois.

I-1f Schedule of Closure
[35 IAC 724.212(b)(6)]

Within 90 days after receipt of the final volume of hazardous wastes, and at the direction of the Board of Directors of Detrex Corporation, final closure activities will be initiated and completed within 180 days of this occurrence. The IEPA will be notified by Detrex 180 days before beginning final closure.

A proposed closure schedule is presented as Attachment I-2. Final closure will be certified by both Detrex Corporation and an independent professional engineer.

I-1g Extensions for Closure Time
[35 IAC 724.213]

Detrex Corporation does not anticipate requiring an extension for closure time for the facility.

I-2 POST-CLOSURE PLAN
[35 IAC 703.183(m), 703.203(f), 703.204(h), 703.207(e), 724.218, 724.297(b) and (c), 724.328(b), 724.328(c)(1)(B), 724.380(c), 724.410(b)]

Post-closure care will not be required for this facility as it is not a disposal facility.

I-3 NOTICE IN DEED

[35 IAC 703.183(n), 724.216, 724.217(c), 724.219]

Notation is not necessary in any deed informing potential purchasers of restrictions associated with a disposal site because this facility is only a hazardous waste storage facility and no hazardous wastes will be disposed on site at any time.

I-4 CLOSURE COST ESTIMATE

[35IAC 703.183(o), 724.242]

The closure cost information is presented in accordance with proper requirements. The total closure cost for the closure of the Detrex Corporation's hazardous waste facility is estimated at $39,185.00. (2002 dollars). Attachment I-3 provides a closure cost estimate. Activities include removal of waste inventory, decontamination and closure certification.

The cost estimate assumptions made are:

1) All hazardous waste storage areas are full to capacity at the time of closure.
2) All hazardous waste will be transported off site to a permitted facility in accordance with all State and Federal regulations.
3) The fact that the hazardous waste or facility equipment may have potential economic value has been ignored.
4) Costs are based on 2002 current year costs. All labor rates reflect commercial rates and include fringe benefits, payroll burden and taxes.
5) Contractor costs (three laborers, supervisor and equipment) are estimated at $1,750 per day based on at $32.00 per hour to account for labor costs and $40.00 per hour for supervisors. All labor rates reflect commercial rates and include fringe benefits, payroll burden and taxes.
6) Total costs include a 10 percent contingency for administrative and 15 percent contingency for miscellaneous operating costs.
7) The costs are based on a point in the operating life when the extent and manner of operation would make closure most expensive.

This closure cost estimate will be maintained at this facility. It will be revised whenever a change in the closure plan affects the cost of closure. It will be adjusted as required by pertinent regulations.

I-5 FINANCIAL ASSURANCE MECHANISM FOR CLOSURE
[35 IAC 703.183(o), 724.243]

Financial assurance for closure costs is provided by an appropriate mechanism closure as found under 35 IAC 703.183. A copy of the most recent mechanism is provided in Attachment I-4.

I-6 POST-CLOSURE COST ESTIMATE
[35 IAC 703.183(p), 724.244]

Since all wastes will be recycled or disposed off site, there will be no post-closure activities or costs.

I-7 FINANCIAL ASSURANCE MECHANISM FOR POST-CLOSURE
[35 IAC 703.183(p), 724.245]

Since all wastes will be recycled or disposed off site, there will be no post-closure activities or costs.

I-8 LIABILITY REQUIREMENTS
[35 IAC 703.183(q), 724.247]

I-8a Coverage for Sudden Accidental Occurrences
[35 IAC 724.247(a)]

A copy of proof of liability insurance is provided in Attachment I-5. This provides an endorsement of certification of appropriate insurance coverage pursuant to 35 IAC 724.247.

I-8a(1) Endorsement or Certification
[35 IAC 724.247(a)(1)]

The requirements of this section do not apply since financial assurance for sudden accidental insurance was provided above.

I-8a(2) Financial Test for Liability Coverage
[35 IAC 724.247(a)(2), 724.247(f)]

The requirements of this section do not apply since financial assurance for sudden accidental insurance was provided above.

I-8a(3) Use of Multiple Insurance Mechanisms
[35 IAC 724.247(a)(3)]

The requirements of this section do not apply since financial assurance for sudden accidental insurance was provided above.

I-8b Coverage for Nonsudden Accidental Occurrences
[35 IAC 724.247(b)]

The Detrex facility does not have a surface impoundment, landfill or land treatment facility; hence, coverage for nonsudden accidental occurrences is not required.

I-8c Request for Variance
[35 IAC 724.247(c)]

Detrex Corporation does not wish to request for variance from the requirements for liability coverage.

I-9 STATE MECHANISMS

Detrex Corporation does not intend to request State assumption of the legal or financial responsibilities for the facility.

ATTACHEMNT I-1

LIST OF HAZARDOUS WASTES

Waste	*EPA Hazardous Waste Number and Hazard Code*
Tetrachloroethylene	**F001 (T), F002 (T), D039 (T), U210 (T)**
Trichloroethylene	**F001 (T), F002 (T), D040 (T), U228 (T)**
1,1,1-Trichloroethane (Methyl chloroform)	**F001 (T), F002 (T), U226 (T)**
Dichloromethane	**F001 (T), F002 (T), U080 (T)**
Trichlorofluoromethane	**F001 (T), F002 (T), U121 (T)**
Arsenic	*D004 (T)*
Barium	*D005 (T)*
Cadmium	*D006 (T)*
Chromium	*D007 (T)*
Lead	*D008 (T)*
Mercury	*D009 (T)*
Selenium	*D010 (T)*
Silver	*D011 (T)*
Benzene	*D018 (T)*
Carbon Tetrachloride	*D019 (T)*
Chlorobenzene	*D021 (T)*
Chloroform	*D022 (T)*
1,4-Dichlorobenzene	*D027 (T)*
1,2-Dichloroethane	*D028 (T)*
1,1-Dichloroethylene	*D029 (T)*
2,4-Dinitrotoluene	*D030 (T)*
Hexachloroethane	*D034 (T)*
Methyl Ethyl Ketone	*D035 (T)*
Pyridine	*D038 (T)*

Note:

Hazard Code based on 40 CFR 261 & may be liquid or solid.
T - Toxic Waste

Waste codes in italics represent underlying constituents and are not accepted without one of the primary waste codes as part of the waste.

Date: 04/30/02
Revision: 02-1

ATTACHMENT I-2
CLOSURE SCHEDULE

TIME REQUIREMENT	WORK REQUIRED
2 weeks	Contract with outside firm to perform closure activities & schedule work dates
2 week	Profile Waste into disposal facility
1 day	Mobilize equipment and manpower to facility to begin closure activities of container storage areas
1 day	Bulk Containerized waste, generate paperwork, and transport off-site for disposal
½ day	Load and transport RCRA empty containers to disposal facility
½ day	Sweep storage area and containerize floor sweepings
1 ½ days	Primary Decontamination (Primary, Secondary, and Tertiary Wash) -Containerize wash water -Sample wash water/ rinseate
1 day	Submit wash water / rinseate samples from container storage area for analysis.
1 week	Obtain analysis of samples
1 day	Additional decontamination as required based on analysis
2 days	Load and transport containerized wash water to disposal facility
½ day	Decontamination equipment and supplies used during closure activities and containers decontamination fluids
½ day	De-mobilize from site
1 day	Inspect closure activity
4 weeks	Generate closure report and certify closure activities

THE TIMES LISTED ABOVE ARE NOT NECESSARILY DONE IN SUSSESSION. THEY ARE PROVIDED TO PROVIDE APPROXIMATE TIMES NECESSARY TO COMPLETE EACH TASK. ADDITIONAL TIME BETWEEN ACTIVITIES MAY BE NECESSARY DUE TO SCHEDULING CONFILCTS.

Date: 04/30/02
Revision: 02-1

Attachment I-3
Closure Cost Estimate (2002 $)

INVENTORY REMOVAL				
	- Transfer container contents to bulk tanker (1 day)			832
		Subtotal A	$	832
B.	SECONDARY CONTAINMENT DECONTAMINATION			
	- Sweep and containerize sweepings (1/2 day)		$	416
	- Clean secondary containment areas and containerize wash waters (1 1/2 day)		$	1,248
		Subtotal B	$	1,664
C.	TRANSPORTATION AND DISPOSAL			
	- Bulked liquid waste disposal	13,200 gal @ $1.00/gal	$	13,200
	- Wash water disposal	220 gal @ $0.75/gal		165
	- Containerized solids/sludges	1 drum @ $255/drum		225
		Subtotal C	$	13,590
D.	SAMPLING AND ANLAYSIS			
	- Technician	2 days @ $600	$	1,200
	- Analytical	water rinse (3) @$450 ea.		1,350
		Soil (4) @$900 ea.		3,600
		Subtotal D	$	5,150
E.	OVERSIGHT/CERTIFICATION			
	- Oversight 9 days @ $710		$	6,390
	- Certification Report LS			3,820
		Subtotal E.	$	10,120
		Subtotal (A through E)	$	31,356.00
		Administration (10%)	$	4,703.40
		Cost (15%)	$	3,135.60
		TOTAL	**$**	**39,185.00**

PERFORMANCE BOND

COPY

d bond executed: May 20, 2000

Effective date: May 20, (1) 2000

Principal: DETREX CORPORATION
24901 Northwestern Highway, Suite 500, Southfield, Michigan 48075

Type of organization: Corporation (4)

State of incorporation: Michigan (5)

Surety(ies): Evergreen National Indemnity Company (6)
10055 Sweet Valley Drive
Valley View, OH 44125

USEPA I.D. No. (7)		Closure Amount (8)	Post-Closure Amount (9)	Closure and Post-Closure Amounts (10)
Name	Detrex Corporation Solvents Division			$90,000.
Address	2537 LeMoyne Avenue			
City	Melrose Park, Illinois 60160			
USEPA I.D. No. (7)				
Name				
Address				
City				

Please attach a separate page if more space is needed for all facilities.

Total penal sum of bond: $ 90,000.00

Surety's bond number: 201915 (11) (12)

Know All Persons By These Presents, That we, the Principal and Surety(ies) hereto are firmly bound to the Illinois Environmental Protection Agency (hereinafter called IEPA), in the above penal sum for the payment of which we bind ourselves, our heirs, executors, administrators, successors, and assigns jointly and severally; provided that, where the Surety(ies) are corporations acting as co-sureties, we, the Sureties, bind ourselves in such sum "jointly and severally" only for the purpose of allowing a joint action or actions against any or all of us, and for all other purposes each Surety binds itself, jointly and severally with the Principal, for the payment of such sum only as is set forth opposite the name of such Surety, but if no limit of liability is indicated, the limit of liability shall be the full amount of the penal sum.

This Agency is authorized to require, pursuant to Illinois Revised Statutes, 1981, Chapter 111 1/2, Section 1210, that this information be submitted to the Agency by the owner or operator of a haz[illegible] waste storage, treatment or disposal site. Failure to provide the information may result in a civil penalty against the owner or operator of not to exceed $25,000 per day of violation. Falsification of [illegible] may constitute a Class 4 felony, and may also carry a fine for the first offense of not to exceed $25,000 per day. This form has been approved by the Forms Management

Principal(s) DETREX CORPORATION

Signature G.J. Israel

Typed Name G.J. ISRAEL

Title VICE PRESIDENT - FINANCE

Date 5/20/00

Signature

Typed Name

Title

Date

Corporate seal

Corporate seal

Corporate Surety(ies)

Name Evergreen National Indemnity Company

Address 10055 Sweet Valley Drive, Valley View, OH 44125

State of incorporation Ohio

Liability limit $ $90,000.00

Signature

Typed name Kathleen P. Price

Title Attorney-in-Fact

Corporate seal

Name

Address

State of incorporation

Liability limit $

Signature

Typed name

Title

Corporate seal

EVERGREEN NATIONAL INDEMNITY COMPANY
CLEVELAND, OHIO
POWER OF ATTORNEY

PRINCIPAL Detrex Corporation EFFECTIVE DATE May 12, 2000

CONTRACT AMOUNT $90,000.00 AMOUNT OF BOND $ $90,000.00

POWER NO. 201915

KNOW ALL MEN BY THESE PRESENTS: That the Evergreen National Indemnity Company, a corporation in the State of Ohio does hereby nominate, constitute and appoint: Daniel J. Needham, Kathy J. Goe, Patricia A. Wall, Debra A. Erickson, Kathleen P. Price, Jill Calfee, Jeffery L. Booth, Laurie A. Krokos, Julie K. Thornton and Felicia P. Young its true and lawful Attorney(s)-In-Fact to make, execute, attest, seal and deliver for and on its behalf, as Surety, and as its act and deed, where required, any and all bonds, undertakings, recognizances and written obligations in the nature thereof, PROVIDED, however, that the obligation of the Company under this Power of Attorney shall not exceed One Million Dollars ($1,000,000.00).

This Power of Attorney is granted and is signed by facsimile pursuant to the following Resolution adopted by its Board of Directors on the 23rd day of February, 1994:

"RESOLVED, That any two officers of the Company shall have the authority to make, execute and deliver a Power of Attorney constituting as Attorney(s)-in-fact of such persons, firms, or corporations as may be selected from time to time.
FURTHER RESOLVED, that the signatures of such officers and the Seal of the Company may be affixed to any such Power of Attorney or any certificate relating thereto by facsimile; and any such Power of Attorney or certificate bearing such facsimile signatures or facsimile seal shall be valid and binding upon the Company; and any such powers so executed and certificate by facsimile signatures and facsimile seal shall be valid and binding upon the Company in the future with respect to any bond or undertaking to which it is attached."

IN WITNESS WHEREOF, the Evergreen National Indemnity Company has caused its corporate seal to be affixed hereunto, and these presents to be signed by its duly authorized officers this 23rd day of February, 1994.

EVERGREEN NATIONAL INDEMNITY COMPANY

Craig L. Stout, President

Roswell P. Ellis, Treasurer

Notary Public)
State of Ohio) SS:

On this 23rd day of February, 1994, before the subscriber, a Notary for the State of Ohio, duly commissioned and qualified, personally came Craig L. Stout and Roswell P. Ellis of the Evergreen National Indemnity Company, to me personally known to be the individuals and officers described herein, and who executed the preceding instrument and acknowledged the execution of the same and being by me duly sworn, deposed and said that they are the officers of said Company aforesaid, and that the seal affixed to the preceding instrument is the Corporate Seal of said Company, and the said Corporate Seal and signatures as officers were duly affixed and subscribed to the said instrument by the authority and direction of said Corporation, and that the resolution of said Company, referred to in the preceding instrument, is now in force.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my official seal at Cleveland, Ohio, the day and year above written.

Gregory N. Miracle, Attorney
Notary Public State of Ohio
My Commission has no expiration date Section 147.03 R.C.

State of Ohio) SS:

I, the undersigned, Secretary of the Evergreen National Indemnity Company, a stock corporation of the State of Ohio, DO HEREBY CERTIFY that the foregoing Power of Attorney remains in full force and has not been revoked; and furthermore that the Resolution of the Board of Directors, set forth herein above, is now in force.

Signed and sealed in Cleveland, Ohio this 12th day of May, 2000.

Anne L. Meyers, Secretary

Any reproduction or facsimile of this form is void and invalid

AMENDED CERTIFICATE OF AUTHORITY

STATE OF ILLINOIS

DEPARTMENT OF INSURANCE

WHEREAS, EVERGREEN NATIONAL INDEMNITY COMPANY

located at COLUMBUS, OHIO

has complied with all the requirements of the ***"Illinois Insurance Code"*** applicable to said Company:

NOW, THEREFORE, I the undersigned, Director of Insurance of the State of Illinois, do hereby authorize the said Company to transact its appropriate business as set forth under clause(s) (a), (b), (c), (d), (e), (f), (g), (h), (i), (j), (k) of Class 2

(a), (b), (c), (d), (e), (f), (g), (h) of Class 3

of Section 4 of the ***"Illinois Insurance Code"*** in this State, in accordance with the laws thereof, until the 1ST day of JULY A.D. 1999.

DEPARTMENT OF INSURANCE STATE OF ILLINOIS

IN TESTIMONY WHEREOF, I hereto set my hand and cause to be affixed the Seal of my office.

Done at the City of Springfield, this 28th day of July A.D. 1998.

A. Dutcher

Arnold Dutcher, Acting *Director of Insurance*

HAZARDOUS WASTE FACILITY CERTIFICATE OF LIABILITY INSURANCE

COMMERCE AND INDUSTRY INSURANCE COMPANY, (the "Insurer, of 70 PINE
NEW YORK, NY 10270 (1) hereby certifies that it has issued liability insurance coverin
injury and property damage to DETREX CORPORATION, (the "insure
2537 LEMOYNE AVENUE, MELROSE PARK, IL 60160 (3) in connection with the insured's obligation
demonstrate financial responsibility (4) under 35 Illinois Administrative Code Parts 724.247 or 725.247. The coverage applies at.

	Sudden Accidental Occurrences (6)	Nonsudden Accidental Occurrences (7)	Sudden and Nonsudden Accidental Occurrences (8)
USEPA I.D. No. ILD 074 427 938 (5)			

Name DETREX CORPORATION

Address 2537 LEMOYNE AVENUE

City MELROSE PARK, IL 60160

USEPA I.D. No.

Name

Address

City

Please attach a separate page if more space is needed for all facilities.

The limits of liability are $1,000,000 each occurrence and $ 2,000,000 annual aggregate exclusive of legal defense costs. The coverage (9) is provided under policy number PLL 5293541 (10) issued on 1/30/98 (12). The effective date of said policy is 1/30/98 to 1/30/2003 (11) (13).

2. The Insurer further certifies the following with respect to the insurance described in Paragraph 1:

   (a) Bankruptcy or insolvency of the insured shall not relieve the Insurer of its obligations under the policy

   (b) The Insurer is liable for the payment of amounts within any deductible applicable to the policy, with a right of reimbursement by the insured for any such payment made by the Insurer. This provision does not apply with respect to that amount of any deductible for which coverage is demonstrated as specified in 35 Illinois Administrative Code 724.247(f) or 725.247.

   (c) Whenever requested by the Director of the Illinois Environmental Protection Agency (IEPA), the Insurer agrees to furnish to the Director a signed duplicate original of the policy and all endorsements.

   (d) Cancellation of the insurance, whether by the Insurer, the insured, a parent corporation providing insurance coverage for its subsidiary, or by a firm having an insurable interest in and obtaining liability insurance on behalf of the owner or operator of the hazardous waste management facility, will be effective only upon written notice and only after the expiration of 60 days after a copy of such written notice is received by the Director.

   (e) Any other termination of the insurance will be effective only upon written notice and only after the expiration of thirty (30) days after a copy of such written notice is received by the IEPA Director.

I hereby certify that the Insurer is licensed to transact the business of insurance, or eligible to provide insurance as an excess or surplus lines insurer, in one or more States.

SIGNATURE Mike Shiley

TYPE NAME MICHAEL SHILEY

TITLE MIDDLE MAREKT MANAGER

AUTHORIZED REPRESENTATIVE OF COMMERCE AND INDUSTRY INSURANCE COMPANY

ADDRESS OF REPRESENTATIVE 1375 E. Ninth Street, Suite 2950, Cleveland, OH 44114

THIS AGENCY IS AUTHORIZED TO REQUIRE THAT THE INSURED SUBMIT THIS DOCUMENT UNDER ILLINOIS REVISED STATUTES, 1981, CHAPTER 111 1/2 SECTION 21(F). FAILURE TO DO SO MAY RESULT IN A CIVIL PENALTY AGAINST THE INSURED OF NOT TO EXCEED $25,000 PER DAY OF VIOLATION. FALSIFICATION OF THIS INFORMATION BY ANY PERSON MAY CONSTITUTE A CLASS 4 FELONY, AND MAY ALSO CARRY A FINE OF NOT TO EXCEED $25,000 PER DAYS FOR THE FIRST OFFENSE. THIS FORM HAS BEEN APPROVED BY THE FORMS MANAGEMENT CENTER

IL 532 1843

SECTION J

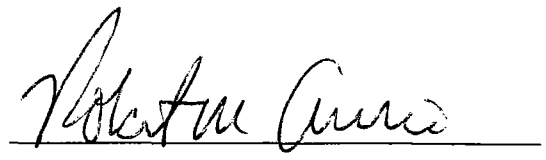
OTHER FEDERAL LAWS

Information will be provided in accordance with the requirements for 35 IAC 703.183(t) at the request of the EPA Region or the IEPA. At this time, however, we believe this facility is in compliance with the following Federal Laws; Wild and Scenic Rivers Act, National Historic Preservation Act of 1966, Endangered Species Act, Coastal Zone Management Act, and the Fish and Wildlife Coordination Act.

SECTION L

OWNER/OPERATOR CERTIFICATION

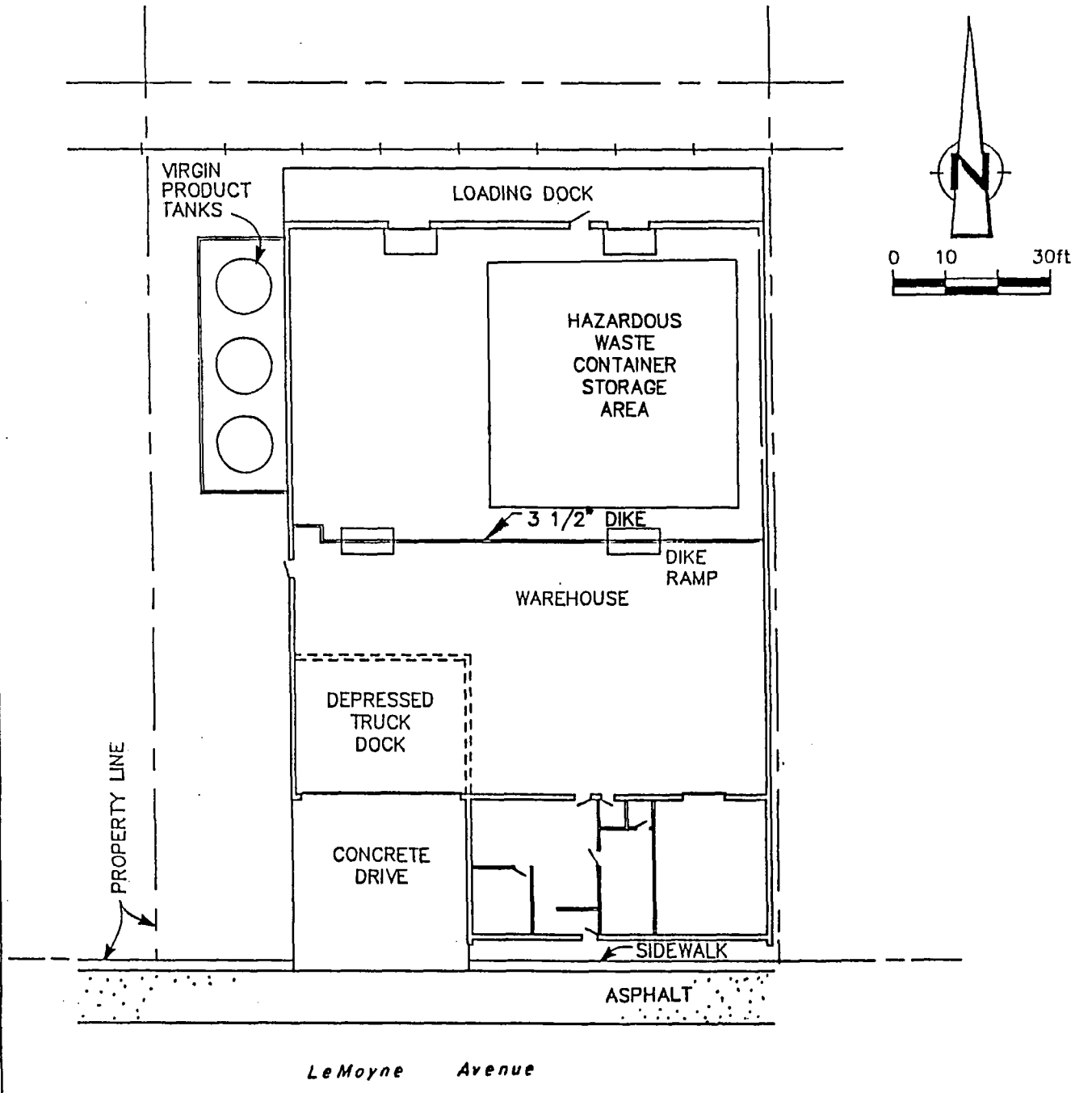
I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature 

Name Robert M. Currie

Title V.P., General Counsel, & Secretary

Date April 30, 2002



FACILITY PLAN
Detrex Corporation
Melrose Park, Illinois Facility

CRA

PART B CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibliity of fine and imprisonment for knowing violations.

Signature Robert J. Jones
Name Robert J. Jones
Title Vice President, General Manage
Date December 27, 1989